BEFORE THE

PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Application of	)	
	)	
HAWAIIAN ELECTRIC COMPANY, INC.	)	DOCKET NO. 2008-0083
	)	
For Approval of Rate Increases and Revised Rate Schedules and Rules	)	
	)	

DIRECT TESTIMONY OF STEPHEN G. HILL

ON BEHALF OF

THE DEPARTMENT OF DEFENSE

AND

CERTIFICATE OF SERVICE

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APRIL 2009

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INTRODUCTION / SUMMARY

Q. PLEASE STATE YOUR NAME, OCCUPATION AND ADDRESS.

A. My name is Stephen G. Hill. I am self-employed as a financial consultant, and principal of Hill Associates, a consulting firm specializing in financial and economic issues in regulated industries. My business address is P.O. Box 587, Hurricane, West Virginia, 25526 (e-mail: hillassociates@gmail.com). A detailed account of my educational background and occupational experience appears in DOD 200, attached to this testimony.

Q. ON BEHALF OF WHOM ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am under contract with the Utility Rates and Studies Office of the U.S. Department of the Navy to perform utility cost of capital studies. The Navy represents the Department of Defense (DOD) and all other Federal Executive Agencies in regulatory proceedings in certain defined geographical areas.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. In this testimony, I present the results of studies I have performed related to the appropriate return on equity to be applied to the electric utility operations of Hawaiian Electric Company (HECO, the Company), a subsidiary of Hawaiian Electric Industries, Inc. (HEI, the Parent). In addition to my testimony regarding the Company's current cost of equity capital for its electric generation operations, I review the cost of capital testimony provided by Dr. Roger Morin and discuss what I believe are the shortcomings contained therein.

Q. HAVE YOU PREPARED EXHIBITS IN SUPPORT OF YOUR TESTIMONY?

A. Yes, Exhibits DOD 200 through DOD 203 contain additional detail regarding certain aspects of my narrative testimony in this proceeding. In addition, DOD 204 through DOD 217 provide the analytical support for the conclusions reached regarding the overall cost of capital for the integrated electric utility operations of HECO presented in the body of the testimony. These Exhibits were prepared by me and are correct to the best of my knowledge

and belief.

Q. PLEASE SUMMARIZE YOUR TESTIMONY AND FINDINGS CONCERNING THE RATE OF RETURN THAT SHOULD BE UTILIZED IN SETTING RATES FOR HECO's ELECTRIC UTILITY OPERATIONS IN THIS PROCEEDING.

A. My testimony is organized into four sections. First, I review the current economic environment in which my equity return estimate is made. Second, I review the capital structure requested by HECO for ratemaking purposes in comparison to capital structures employed by the Company and its parent historically, as well as capital structures prevalent in the electric utility industry. From that review, I develop a capital structure appropriate for ratemaking purposes.

Third, I evaluate the cost of equity capital for similar-risk utility operations using Discounted Cash Flow (DCF), Capital Asset Pricing Model (CAPM), Modified Earnings-Price Ratio (MEPR), and Market-to-Book Ratio (MTB) analyses. Fourth, I comment on the pre-filed cost of capital testimony submitted by Company witness, Dr. Roger Morin.

I have estimated the equity capital cost of similar-risk electric utility companies to fall in a range of 9.25% to 10.25%. Within that range, due to the Company's relatively low financial risk as well as the new regulatory paradigm to be implemented in Hawaii, I estimate the equity cost of the Company's utility operations to be below the mid-point of a reasonable range of equity costs for otherwise similar-risk electric utilities —9.50%.

Applying that 9.50% equity capital cost to the Company's recent average capital structure, containing 52.01% common equity, 1.82% preferred stock, 2.58% hybrid securities, 37.87% long-term debt, and 5.72% short-term debt, produces an overall cost of capital of 7.84% (DOD 217). That overall cost of capital affords the Company an opportunity to achieve a pre-tax interest coverage level of 4.71 times. That level of pre-tax coverage is well above the level of interest coverage actually achieved by HECO over the past five years, which has averaged 3.41x.[1] Therefore, the capital structure and equity return

[1] HECO 2006 S.E.C. Form 10-K, Exhibit 12 (Pre-tax interest coverages: 2006 (3.27x), 2005 (3.36x), 2004 (3.60x); average = 3.41).

I recommend is sufficient to support the Company's financial position and fulfills the requirement of providing the Company the opportunity to earn a return which is commensurate with the risk of the operation while maintaining the Company's ability to attract capital.

Q. WHY SHOULD THE COST OF CAPITAL SERVE AS A BASIS FOR THE PROPER ALLOWED RATE OF RETURN FOR A REGULATED FIRM?

A. The Supreme Court of the United States has established, as a guide to assessing an appropriate level of profitability for regulated operations, that investors in such firms are to be given an opportunity to earn returns that are sufficient to attract capital and are comparable to returns investors would expect in the unregulated sector for assuming the same degree of risk. The Bluefield and Hope cases provide the seminal decisions [Bluefield Water Works v. PSC, 262 US 679 (1923); FPC v. Hope Natural Gas Company, 320 US 591 (1944)]. These criteria were restated in the Permian Basin Area Rate Cases, 390 US 747 (1968). However, the Court also makes quite clear in Hope that regulation does not guarantee profitability and, in Permian Basin, that, while investor interests (profitability) are certainly pertinent to setting adequate rates, those interests do not exhaust the relevant considerations.

As a starting point in the rate-setting process, then, the cost of capital of a regulated firm represents the return investors could expect from other investments, while assuming no more and no less risk. Since financial theory holds that investors will not provide capital for a particular investment unless that investment is expected to yield the opportunity cost of capital, the correspondence of the cost of capital with the Court's guidelines for appropriate earnings is clear.

Q. THE COST OF EQUITY CAPITAL IS OFTEN ESTIMATED USING A COMPLEX ARRAY OF ECONOMIC MODELS AND ALGEBRAIC FORMULAS. IS THERE A SIMPLE WAY TO UNDERSTAND THE CONCEPT OF THE COST OF EQUITY CAPITAL?

A. Yes. In a regulated rate setting context such as this, the estimation of the cost of equity capital can be most easily understood as the means to determine the amount of profit that should be allowed for a regulated firm. A firm's profit is the amount of money that remains from its revenues after a firm has paid all of its costs—operating costs (commodity supply costs, depreciation, equipment maintenance costs, salaries, fees, taxes, retirement obligations, ETC.), as well as all applicable Federal and State income taxes and interest costs. That dollar amount of profit, divided by the amount of common equity capital used to finance the firm's regulated assets equals a percentage rate of return on equity.

The purpose of all of the economic models and formulas in cost of capital testimony in utility rate proceedings is to estimate, using market data of similar-risk firms, the percentage rate of return investors require for that particular risk-class of firm (utilities). If the profit included in the rates, as a percent of the firm's equity capital, is set equal to the cost of equity capital (the investors' required return), the utility, under efficient management, will be able to attract the capital necessary to maintain the firm's financial integrity and the interests of investors and ratepayers will be balanced, as called for in the U.S. Supreme Court cases cited above.

Simply put, therefore, the amount of profit the utility should have the opportunity to earn, expressed as a percentage of the utility's total equity investment, should be equal to the cost of equity capital.

Q. HOW MUCH PROFIT WOULD HECO BE ALLOWED TO EARN EVERY YEAR, BASED ON YOUR RECOMMENDED 9.5% EQUITY RETURN?

A. A 9.5% allowed return on the rate base recommended by DOD of approximately $1.3 Billion, which is comprised of 54.3% common equity (based on the capital structure requested by HECO), would afford the Company an opportunity to earn an annual profit of $67 Million. [$1.3 Billion x 54.3% x 9.5%] The Company's rate request, based on an allowed return on equity of 11.25%, would provide HECO an opportunity to earn an annual profit of $79 Million every year. [$1.3 Billion x 54.3% x 11.25%] From a "bottom line"

perspective, then, the difference between the equity return I recommend and that requested by the Company is approximately $12 Million, annually.

Of course, from a ratepayer perspective, the impact of the difference between the Company's equity return request and what I recommend would be greater, because ratepayers must provide not only a reasonable profit but also the income taxes to be paid on that allowed profit. Assuming an aggregate tax factor of 38%, the annual ratepayer equity return contribution included in rates would be $108 Million with a 9.5% allowed return on equity [$67 Million / (1-38%)] and $127 Million with an allowed return on equity of 11.25% [$79 Million / (1-38)]. Therefore the impact on ratepayers of the difference between the equity return requested by the Company and that supported in my testimony would be approximately $20 Million every year.

Q. MR. HILL, ARE YOU AWARE OF THE HAWAII CLEAN ENERGY INITIATIVE (HCEI)?

A. Yes.

Q. DOES THE HCEI HAVE AN IIMPACT ON THE OVERALL OPERATING RISK OF HECO?

A. Yes, it does.

Q. WHAT ARE YOUR COMMENTS REGARDING THE HAWAII CLEAN ENERGY INITIATIVE AND ITS IMPACT ON THE COMPANY'S OPERATING RISK?

A. On October 20, 2008 HECO and its regulated subsidiaries entered into an agreement with the Governor of Hawaii, the Department of Business, Economic Development and Tourism, and the Division of Consumer Advocacy setting forth goals and objectives under the Hawaii Clean Energy Initiative. The purpose of the HCEI is a "fundamental and sustained transformation in the way in which energy resources are planned and used" in Hawaii (HEI 2008 Annual Report, p. 85). The agreement requires that the parties pursue multiple initiatives that are designed to reduce the State's dependence on imported fossil fuels

through substantial increases in the use of renewable energy and programs that increase energy efficiency and conservation. This agreement also recognizes that the innovative, forward-looking regulatory regime set out in the HCEI must include the need for preserving financially sound utilities. As such, several aspects of the HCEI do, indeed, provide a "fundamental and sustained transformation" from prior regulatory procedures in Hawaii and includes programs that lower the Company's operating risk.

First, revenues will be de-coupled from sales. A decoupling regime seeks to provide that the utility recovers its projected revenue requirement regardless of the number of kilowatt hours sold. Under that ratemaking paradigm, fluctuations in sales to consumers caused by weather, or the service territory economy, or by customer conservation have no affect on the utility's revenues. For example, under a decoupling plan, HECO's revenues would not be affected at all by the current economic downturn and any reduction in sales that might ensue due to reduced hotel occupancy or any other customer conservation would not translate into lost revenues for HECO. Decoupling reduces utility risk because it reduces revenue volatility.

Attached as DOD 201 to this testimony is a paper I presented in 1992 to a NARUC conference on Integrated Resource Planning, which is related to decoupling and quantifying its impacts on the cost of equity capital. That paper presents a relatively simple analysis and estimates the impact of a full decoupling regime on the cost of equity capital to be in the range of 50 to 100 basis points. However, I have performed no current study with regard to HECO and make no specific recommendation in this proceeding to lower the cost of equity capital because of decoupling. Rather, I present this study and the logic it contains as support for my position that HCEI and its decoupling provisions will lower the Company's operating risks compared to the Company's prior regulatory status.

Second, HCEI mandates substantial capital additions to HECO's utility plant. This provides a two-fold benefit for HECO. Increasing rate base is the fundamental manner in which utilities grow, and government-mandated increases to rate base (through a co-operative regulatory process) are unlikely to be challenged. That would almost certainly not be the case in a utility-only "go-it-alone" scenario with significant plant additions. The

other benefit to HECO of the capital building program is that HCEI creates a Clean Energy Infrastructure Surcharge (CEIS), which will "expedite cost recovery for a variety of infrastructure that supports greater use of renewable energy or grid efficiency (such as advanced metering, energy storage, interconnections and interfaces" (HEI 2008 Annual Report, p. 86). HCEI provides that the CEIS will be used to recover annual costs that would otherwise (i.e., under a traditional regulatory regime) be expensed in the year in which they are incurred. Therefore, the Company will much more quickly recover its infrastructure-related construction costs under HCEI, compared to traditional Hawaii regulation. Again, HECO's operating risks are lowered by HCEI.

Third, HCEI confirms the continued use of currently approved tracking (make-whole) mechanisms for pension fund and post-retirement benefits, but it also adds an automatic adjustment mechanism for changes in state or federal tax rates. When utility expense items are automatically adjusted between rate cases, the firm's operating risk is reduced.

Fourth, HCEI confirms that HECO's Energy Cost Adjustment Clause (ECAC) will continue. Moreover, a separate surcharge is to be established to allow HECO and its subsidiaries to pass through "all reasonably incurred purchased power costs, including all capacity, operating and maintenance expenses and other non-energy payments approved by the PUC" (HEI 2008 Annual Report, p. 88). That reduces HECO's risk because some of those costs are currently recovered through base rates and cannot be adjusted except through a rate filing. As a result of HECI, those costs will be recovered *monthly* through a surcharge to rates, which will be reconciled to actual expenses quarterly. Again, HCEI will allow the Company to recover operating expenses quickly and automatically through a surcharge rather than through the contested review of a rate proceeding, lowering the Company's operating risk by reducing earnings volatility.

In summary, electric utility regulation for HECO under HCEI in partnership with the State of Hawaii will be a less risky proposition than it has been in the past. Revenue and earnings volatility will be reduced as a result of the aspects of HCEI cited above. In addition, the responsibility for Hawaii's energy future will now be shared with state

government, which will add support and financial strength to the HECO's new energy future.

Q. MR. HILL, HAVE YOU QUANTIFIED THE REDUCTION IN HECO's COST OF EQUITY CAPITAL ENGENDERD BY THE NEW REGULATORY COMPACT THAT WILL EXIST UNDER HCEI?

A. While I have recommended a reduction in the allowed return for HECO to account for quantifiable financial risk differences that are described in detail subsequently in my testimony, I have made no additional downward adjustment for the additional risk reducing aspects of HCEI, cited above. Nevertheless, it is simple common sense that allowing a utility to recover its projected revenues rather than be subject to fluctuating kilowatt-hour sales in a decoupling regime will reduce both revenue volatility and risk. The same is true for automatic recovery of HCEI-related expense items as well as the expansion of ECAC recovery.

With reduced risk, the rate of return allowed the Company should also be lower than it would have been absent HCEI. This should not be construed as any sort of negative aspect of a truly innovative approach to future energy supply and use, but rather a rational assessment of risk and return. An income stream that is less volatile is less risky and should be afforded a lower return—it is just that simple.

However, rather than attempt to project any precise "basis point" impact of HCEI, I believe its risk-reducing aspects can be appropriately recognized by this Commission shifting its view of HECO as an above-average risk utility to one that, with HCEI, has lower-than-average risk. As such, after the Commission determines a reasonable range for the cost of equity for HECO, it would be appropriate to utilize the lower portion of that range when awarding an allowed return. In allowing HECO a lower level of profit that it would have absent HCEI, the Commission would fulfill its obligation to provide the Company a reasonable opportunity to earn an appropriate risk-adjusted return, while providing Hawaii ratepayers some of the benefits arising from the lower operating risks afforded HECO by the public/private partnership newly codified in the HCEI agreement.

I. ECONOMIC ENVIRONMENT

Q. WHY IS IT IMPORTANT TO REVIEW THE ECONOMIC ENVIRONMENT IN WHICH AN EQUITY COST ESTIMATE IS MADE?

A. The cost of equity capital is an expectational, or *ex ante*, concept. In seeking to estimate the cost of equity capital of a firm, it is necessary to gauge investor expectations with regard to the relative risk and return of that firm, as well as that for the particular risk-class of investments in which that firm resides. Because this exercise is, necessarily, based on understanding and accurately assessing investor expectations, a review of the larger economic environment within which the investor makes his or her decision is most important. Investor expectations regarding the strength of the U.S. economy, the direction of interest rates and the level of inflation (factors that are determinative of capital costs) are key building blocks in the investment decision. The analyst and the regulatory body should review those factors in order to assess accurately investors' required return—the cost of equity capital to the regulated firm.

Q. WHAT ARE THE INDICATIONS WITH REGARD TO THE COST OF CAPITAL IN THE CURRENT ECONOMIC ENVIRONMENT?

A. In the tumultuous economic environment that has existed since the end of the third quarter of 2008, the signals with regard to the cost of capital are, unsurprisingly, mixed. Examining the changes in U.S. Treasury and corporate interest rates illustrates the difficulty of discerning long-term return expectations in this environment.

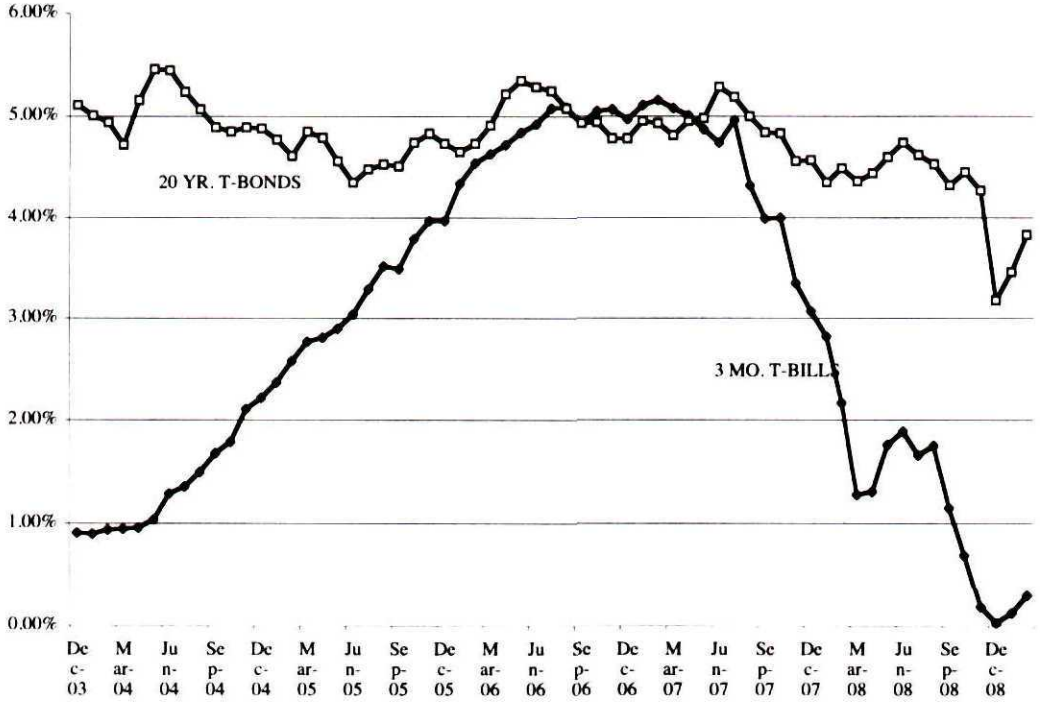
First, the level of long-term fixed-income capital costs represented by U.S. Treasury bonds, which have been relatively moderate for several years, have recently declined to new lows. As shown in Chart I, although there were wide fluctuations in *short-term* interest rate levels over the past five years as the Federal Reserve Board (the Fed) raised and lowered the Federal Funds rate to slow down and encourage (respectively) economic growth, long-term interest rates ranged from 4.5% to 5.5% over most of that time, with a slow downward trend. However, as a result of the recent economic downturn and market re-alignment, long-

term Treasury bond yields have fallen well below the lower end of that historical range. According to the Federal Reserve Statistical Release H.15, the average 30-year T-Bond yield in February 2009 was 3.59%.[2]

Current data also indicate that the Fed has recently lowered short-term interest rates to near zero to attempt to lessen the impact of the pending recession and, concurrently, investors have bid up the prices and lowered long-term interest rates on Treasuries, accepting lower long-term returns. As a result, fundamental long-term capital costs represented by 20-year Treasury bonds have decreased as a result the recent financial crisis.

Chart I

Recent Interest Rate Changes



Data from Federal Reserve Statistical Release H.15

Because the market for U.S. Treasury securities has remained liquid, it is reasonable to believe that the recent low yields (approximately 3.6%) on long-term Treasuries are

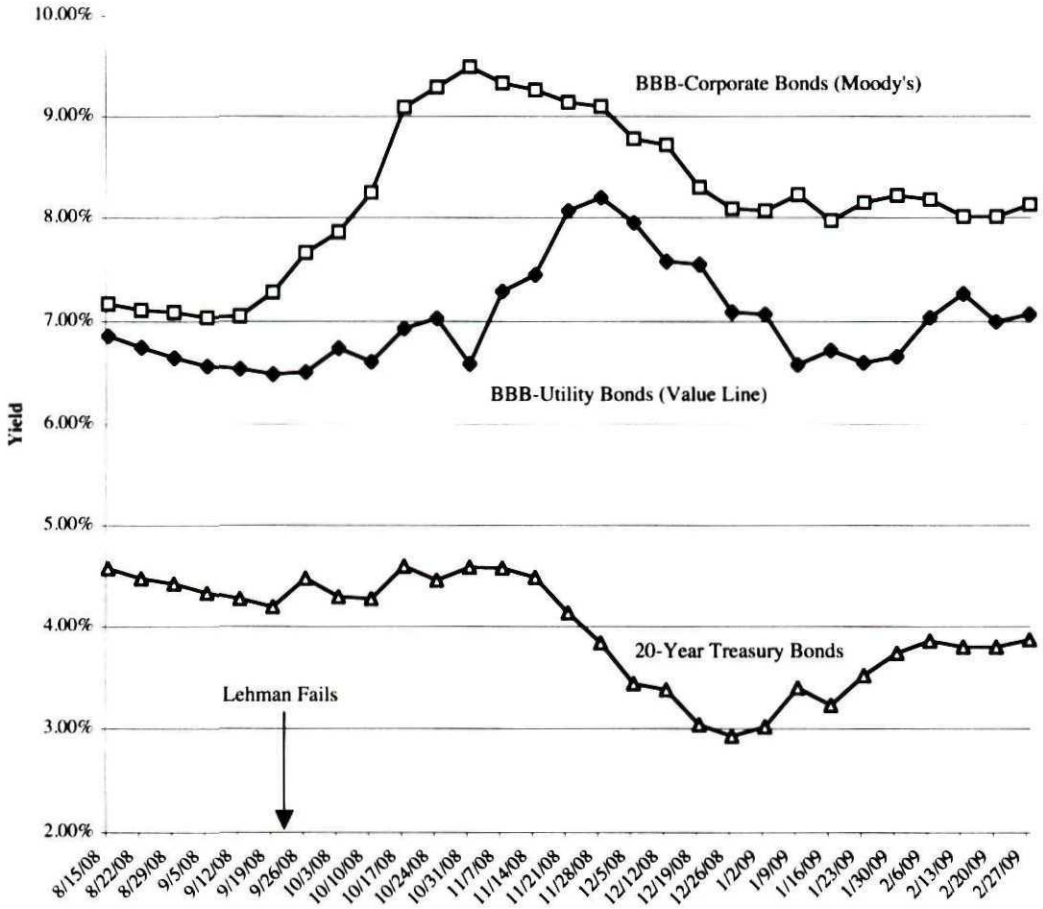
[2] http://www.federalreserve.gov/Releases/H15/Current/, March 2, 2009.

representative of investors' current long-term risk-free return expectations. Therefore, this fundamental building block of capital costs (the risk-free rate) provides an indication that in the current economic environment, capital costs are lower.

However, declining yields has not been the case with corporate bonds over the past few months. Following the demise of Lehman Brothers and the devolution of the financial community in the U.S. and abroad due to enormous debt obligations related to mortgage-back securities and credit default swaps—even with the promise of government support of the successor financial institutions—there was a lack of liquidity in that sector of the market. The banks and investment brokerage firms were holding on to capital in order to shore up their own balance sheets rather than re-injecting those monies into the financial system through lending (buying corporate debt). As a result, even though the Fed was driving down short-term Treasury rates to provide additional liquidity for the economy in general, that liquidity was not reaching the corporate bond market and, with a lack of capital supply, corporate bond yields increased, as shown in Chart II, below.

Chart II

Financial Crisis: Bond Yield Changes



Following the failure of Lehman Brothers, as the full extent of the debt overhang in the financial industry became known, BBB-rated corporate bond yields began to increase, even as long-term Treasury yields remained relatively steady at about 4.5%. According to Value Line *Selection & Opinion* (weekly editions from 8/15/08 through 2/27/09), BBB-rated utility bond yields rose as well, but not to the extent of corporate bonds due, it is reasonable to believe, to the lower risk of utilities. As the economic malaise has continued, some liquidity has been restored to the bond markets, causing both corporate and utility bond yields to decline from the highs established in the Fall of 2008. Most recently,

according to Value Line, utility bond yields have declined to about 7%—slightly higher than their "pre-crisis" levels. That has not yet occurred with corporate yields reported by Moody's, although those yields have declined from their highs. Also, long-term Treasury bond yields have begun to increase from their lowest point established at the end of 2008. On balance, then, the fixed-income data available in the market indicates that while there were technical difficulties in the corporate bond market that drove up yields for a period of time, it does not appear to be a long-term phenomenon and the high yields experienced in the latter part of 2008 are unlikely to represent investors' long-term expectations. Those data also indicate that investors' required return for a risk-free investment remains low by historical standards—around 3.8%. Therefore, the bond yield data available in the market place indicates that the risk-free rate of return, a fundamental element of all capital costs has declined as a result of the current economic environment.

With regard to other broad indicators of the cost of capital—dividend yields and growth rates—the data show that there has been an increase in the cost of equity capital during the recent economic downturn. AUS Utility Reports, in its March 2009 publication, indicates that electric utility dividend yields increased, on average, 140 basis points between September 2008 and March 2009. Also, in January 2009, IBES (an investor service that polls sell-side analysts for their earnings per share growth rate projections) indicates that the five-year earnings growth rate projections for electric utilities have declined by an average of approximately 45 basis points over that time period.[3] While, as I discuss in more detail subsequently, earnings growth rate projections are not reliable as a sole indicator of long-term sustainable growth necessary for a reliable DCF estimate of the cost of equity capital, these dividend yield and growth rate data provide an indication that the cost of capital has increased as a result of the on-going financial crisis. In addition, it has been my experience that projected earnings growth rates respond more slowly to current events than do stock prices and dividend yields, causing an earnings-based DCF indication to lag the actual cost of capital. As I show subsequently in my own DCF analysis, which is based on a broader

[3] IBES Utility Long-Term Growth Rate Report, January 2009, p. 37.

sample of growth rates, the DCF for electric utilities does indicate that the cost of equity has risen to some degree since the pre-crisis levels, but not by 100 basis points.

Here we have DCF-based data indicating an increase in equity costs, along with the fixed-income (bond yield) data discussed above lending credence to the notion that investors' return expectations have been lowered somewhat by the recent events in the financial markets. Therefore, it is reasonable to assume from publicly-available data that cost of equity capital is likely to be similar to or somewhat higher than it was at mid-year 2008 for electric utilities similar in risk to HECO.

Q. WHAT IS THE CURRENT EXPECTATION WITH REGARD TO THE ECONOMY AND INTEREST RATES?

A. As Value Line notes in its most recent Quarterly Review the current expectation is that the economy will show negative growth through mid-year 2009. However, once the economy begins to improve, increasing inflation pressures with energy, food and commodities indicate that the next interest rate move by the Fed will be toward tightening credit (i.e., increasing interest rates).

> **Economic Growth:** As noted, the economy declined modestly in last year's third quarter, with GDP easing by 0.5%. The setback was materially greater in the final period, with the decline in GDP reaching 3.8%, under pressure from reductions in consumer spending, falling demand for business equipment, and additional reversals in housing construction. We think that the current trends are consistent with an even sharper decline in business activity (perhaps 5% or so) during the present quarer and a smaller, but still significant, drip of 3% or so, in GDP during he second quarter. As indicated we could see a tepid attempt at a business recovery by the third quarter of this year [chart omitted].
>
> **Inflation**: One problem that is not likely to stand in the way of a possible economic comeback later this year is inflation. In fact, inflation appears to be yesterday's problem, with deflation being a bigger threat now. Indeed, we expect producer (or wholesale) and consumer prices to both fall during 2009, under pressure from lower oil and commodity prices. Meanwhile, we think that the so-called core rate of inflation, which excludes food and energy prices, will stay

> in—or even below—the Federal Reserve's 1%-2% comfort zone in 2009.
>
> **Interest Rates**: Late last year, the Federal Reserve, under pressure from eroding economic activity, voted to lower the federal funds rate to near zero. Other short-term interest rates, such as those on three and six-month Treasury bills, are likewise negligible, as efforts to get the economy moving forward again continue. We believe these short-term borrowing costs will stay near present levels throughout this year. Longer-term interest rates, such as those for 10-year Treasury Notes and 30-year Treasury Bonds, which are more tied to longer-range inflation expectations, are also low by historical standards, but have started to edge upward, reflecting the higher level of spending and borrowing that will be needed if the economy is to revive itself this year...Our expectation is that interest rates of all maturities will remain fairly low for another year or two [Chart omitted] before rising again. (The Value Line Investment Survey, *Selection & Opinion*, February 20, 2009, pp. 3681, 3682.)

In that most recent Quarterly Economic Review cited above, Value Line projects that inflation as measured by the Consumer Price Index will be negative in 2009 and 2.0% in 2010, and that long-term Treasury bond rates will average 3.7% in 2009 and 4.8% through 2010. Over the longer term, Value Line projects that long-term Treasury Bonds will provide an average yield of 4.8% by 2013. As shown in Chart I, that level would be similar to that established for several years prior to the recent financial market dislocation.

Another recent forecast by Blue Chip Financial Forecasts (a service that polls 50 leading economists), published January 1, 2009, indicates lower long-term Treasury bond yields in 2009 and 2010—3.2% and 3.9%, respectively. As noted previously, the recent 20-year T-bond yield in February, according to the Federal Reserve is 3.8% (Federal Reserve Statistical Release H.15, March 2, 2009). Therefore, the indicated expectation with regard to long-term interest rates is that they could move somewhat higher in the future as the economy (hopefully) recovers.

II. CAPITAL STRUCTURE

Q. WHAT IS THE CAPITAL STRUCTURE REQUESTED BY THE COMPANY IN THIS PROCEEDING?

A. The Company's requested capital structure is shown on HECO-2001. That capital structure consists of 54.30% common equity, 4.05% preferred stock, 1.89% hybrid securities, 38.27% long-term debt, and 1.49% short-term debt.

Q. IS THAT CAPITAL STRUCTURE SIMILAR TO THE MANNER IN WHICH HECO HAS BEEN RECENTLY CAPITALIZED?

A. Yes. However, the Company's requested capital structure contains a slightly higher percentage of common equity and a lower percentage of debt capital than the Company has actually utilized over the most recent five quarters, according to the Company's consolidated balance sheets published in its Securities and Exchange Commission (SEC) filings. As shown on page 1 of DOD 204, the equity capital portion of HECO's capital structure has fluctuated between 52% and 54% of total capital, averaging 53% common equity over that recent period.

Q. IS THE CAPITAL STRUCTURE REQUESTED BY THE COMPANY IN THIS PROCEEDING SIMILAR TO THE AVERAGE CAPTIAL STRUCTURE IN THE ELECTRIC INDUSTRY TODAY?

A. No. The capital structure requested by HECO in this proceeding contains considerably more common equity and less total debt (long- and short-term debt) than is used on average in the electric industry today. DOD 204, page 2 shows common equity ratio as a percent of total capital (i.e., including short-term debt) for the electric industry as published in the March 2009 edition of AUS Utility Reports.

The average common equity ratio in the electric utility industry is 44%. Also shown on page 2 of DOD-204 are the average common equity ratios of my similar-risk sample group, as well as that of Dr. Morin's two sample groups (his integrated electric group and

his Moody's electric group). The average common equity ratio of all those similar-risk sample group companies ranges from 43% to 44% of total capital. Those common equity ratios, for companies with similar bond ratings to HECO (my sample group), are substantially below the level of common equity requested by HECO in this proceeding. By this objective measure, the capital structure requested by HECO in this proceeding implies substantially lower financial risk than the electric industry, generally, as well as the sample groups used in this proceeding to estimate the cost of equity capital.

Q. DOESN'T THE COMPANY TESTIFY THAT IT NEEDS A HIGHER COMMON EQUITY RATIO BECAUSE ITS PURCHASED POWER CONTRACTS ARE TREATED AS ADDITIONAL DEBT BY THE BOND RATING AGENCIES?

A. Yes, that is the Company's position; and it is true that purchased power expenses are considered by rating agencies as debt-like obligations, when calculating bond rating benchmarks. However, the companies in my sample group have purchased power expenses similar to HECO, and those companies maintain an average bond rating equal to HECO's with an average common equity ratio of only 44%.

HECO reports in its 2008 S.E.C. Form 10-K (p. 21 of Exhibit 13, Annual Report), that purchased power expenses in 2008 were at a level that equaled 24% of revenues. Six companies in my sample group provide enough detail regarding purchased power expenses to calculate that their average purchased power expense is approximately 32% of their 2008 electric revenues. Also Value Line reports that 39% of HECO's power supply is from purchased power, and, for the other companies in my sample group for which Value Line reports purchased power percentages, the average is 37%. Therefore, those companies have, by that measure, generally similar purchased power risk to HECO. Those companies are also capitalized more economically (less expensively), i.e., with considerably less common equity and more debt than HECO. Their average bond rating is "BBB", the same as HECO's bond rating.

There are two other points to note regarding the Company's relative risk position. First, within its matrix of risk rankings Standard & Poor's assigns HECO's parent

company, HEI a business risk of "Strong" and a financial risk of "Aggressive." The sample of companies I have selected to estimate the cost of capital have the same median rankings, "Strong" (business risk) and "Aggressive" (financial risk). Moreover, HEI is more leveraged (i.e., has more debt and less common equity) than HECO. AUS Utility Reports (March 2009) indicates that HEI's common equity ratio is 38% of total capital.

Second, according to the Company's response to DOD-IR-13, its purchased power expenses have proven to be fairly predictable. As shown in the table below, provided by the Company, HECO has been able to accurately predict its purchased power expense during the projected test year in its past four rate cases. When a significant operating expense is unpredictable, it can increase risk and, conversely, when it is predictable it can moderate risk.

Table I.

Comparison Between HECO Test Year Estimate and Actual Purchased Power Expense

	TY Purchased Power Expense (Approved by PUC Interim D&O or D&O)	Actual Purchased Power Expense	Difference Between HECO Projections and Actual
2007 Rate Case Docket No. 2006-0386	2007 Test Year $387,492,053	2007 Recorded $368,811,012	$13,681,041
2005 Rate Case Docket No. 04-0113	2005 Test Year $345,321,000	2005 Recorded $339,265,651	$6,055,349
1995 Rate Case Docket No. 7766	1995 Test Year $235,072,000	1995 $241,216,880	($6,144,880)
1994 Rate Case Docket No. 7700	1994 Test Year $231,052,000	1994 $235,061,818	($4,009,818)

Data from Company response to DOD-13 Attachment 1.

In summary, while it is certainly true that HECO has substantial purchased power expenses, that level of expense is not substantially different from the companies in my similar-risk sample group, which have similar business risk rankings and bond ratings.

However, the common equity ratio proportion of HECO's capital structure is substantially higher than the average for the sample group, indicating lower financial risk for HECO.

Q. WHAT CAPITAL STRUCTURE DO YOU RECOMMEND FOR RATESETTING PURPOSES IN THIS PROCEEDING?

A. Because the Company's booked capital structure approximates its requested capital structure, for ratemaking purposes I recommend the use of the capital structure requested by the Company. However, because HECO's ratemaking capital structure, which contains approximately 54% common equity, is substantially less leveraged (less financially risky) than that of either the industry as a whole or the sample group of electric companies I use to estimate the cost of equity capital, the allowed return on common equity for HECO should be below the mid-point for the sample group due to account for the Company's lower financial risk.

Page 3 of DOD-204 shows the recommended ratemaking capital structure and associated cost rates. The capital structure consists of 54.30% common equity, 4.05% preferred stock, 1.89% hybrid securities, 38.27% long-term debt and 1.49% short-term debt. The cost rates of preferred stock, hybrid securities, and long-term debt are those requested by the Company.

The cost rate of short-term debt utilized by the Company for the forward test year is 3.25%. That cost rate has not been updated. However, given the current state of the economy and short-term interest rates, I believe that short-term debt cost rate will overstate the Company's actual costs. Currently, according to the March 2, 2009 Federal Reserve's Statistical Release H.15, six-month commercial paper is carrying a yield of approximately 1/2%. The January 1, 2009 edition of Blue Chip Financial Forecasts indicates that one-month commercial paper is expected to have a cost rate of 1.5% through the second quarter of 2010 and the London Interbank Offering Rate (LIBOR) is expected to be only 2.0% by that time. Therefore, in my view, a 2.5% cost rate estimate for short-term debt, which is conservative, would be a more reliable indicator of the Company's actual short-term debt costs in the test year. I will use a cost rate of short-term debt for HECO of 2.5%.

III. METHODS OF EQUITY COST EVALUATION

A. DISCOUNTED CASH FLOW MODEL

Q. PLEASE DESCRIBE THE DISCOUNTED CASH FLOW (DCF) MODEL YOU USED TO ARRIVE AT AN ESTIMATE OF THE COST RATE OF COMMON EQUITY CAPITAL FOR THE COMPANY IN THIS PROCEEDING.

A. The DCF model relies on the equivalence of the market price of the stock (P) with the present value of the cash flows investors expect from the stock, and assumes that the discount rate equals the the cost of equity capital. The total return to the investor, which equals the required return and the cost of equity capital according to this theory, is the sum of the dividend yield and the expected growth rate in the dividend.

The theory is represented by the equation,

$$k = D/P + g, \qquad (1)$$

where "k" is the equity capitalization rate (cost of equity, required return), "D/P" is the dividend yield (dividend divided by the stock price) and "g" is the expected sustainable growth rate.

Q. WHAT GROWTH RATE (g) DID YOU ADOPT IN DEVELOPING YOUR DCF COST OF COMMON EQUITY FOR THE COMPANY IN THIS PROCEEDING?

A. The growth rate variable in the traditional DCF model is quantified theoretically as the constant dividend growth rate investors expect to continue into the indefinite future. The DCF model is actually derived by 1) considering the dividend a growing perpetuity, that is, a payment to the stockholder which grows at a constant rate indefinitely, and 2) calculating the present value (the current stock price) of that perpetuity. The model also assumes that the company whose equity cost is to be measured exists in a steady state environment, i.e., the payout ratio and the expected return are constant and the earnings, dividends, book value

and stock price all grow at the same rate, forever.

While that assumption seems unrealistic because, in the short term, growth rates in those parameters can be quite different, over the long term it has proven to be a very reasonable assumption. According to Value Line's published year-by-year retrospective of the Dow Jones Industrials from 1920 through 2005, the average earnings, dividend and book value growth rates over that time period were 5.3%, 4.9% and 5.2%.[4] For utilities, over the long term, those growth rates in earnings, dividends and book value are even closer. As shown in DOD-205, Moody's Public Utility Manual reports that between 1947 and 1999 that average growth in earnings, dividend and book value growth of Moody's Electric Utilities was 3.34%, 3.22% and 3.66%, respectively.[5] Therefore, for both regulated and unregulated firms, available historical data show that the theoretical DCF assumption that dividends, earnings and book value grow at approximately the same rate over the long-term is well-grounded, and provides a reliable explanation of the manner in which stocks are valued.

Even though the DCF's fundamental assumptions are sound, as with all mathematical models of real-world phenomena, the DCF theory does not exactly "track" reality in the shorter term. Payout ratios and expected equity returns as well as earnings and dividend growth rates do change over time. Therefore, in order to properly apply the DCF model to any real-world situation and, in this case, to find the long-term sustainable growth rate called for in the DCF theory, it is essential to understand the determinants of long-run expected dividend growth.

Q. CAN YOU PROVIDE AN EXAMPLE TO ILLUSTRATE THE DETERMINANTS OF LONG-RUN EXPECTED DIVIDEND GROWTH?

A. Yes, in DOD-202, I provide an example of the determinants of a growth rate on which to base a reliable DCF estimate. In addition, in DOD-202, I show how reliance on earnings or

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[4] www.valueline.com, Dow Jones Long Term Chart (PDF)

[5] Mergent Public Utility Manual, 2001, pp. a20-a22. (Moody's ceased publication of it's Public Utility Manual in 2001, selling it to Mergent, Inc.)

dividend growth rates alone, absent an examination of the underlying determinants of long-run dividend growth, can produce inaccurate DCF results.

Q. DID YOU USE A SUSTAINABLE GROWTH RATE APPROACH TO DEVELOP AN ESTIMATE OF THE EXPECTED GROWTH RATE FOR THE DCF MODEL?

A. While I have calculated both the historical and projected sustainable growth rate for a sample of utility firms with similar-risk operations, I have not relied solely on that type of growth rate analysis. To estimate an appropriate DCF growth rate, I have also utilized published data regarding both historical and, where available, projected growth rates in earnings, dividends, and book value for the sample group of utility companies. Through an examination of all of those data, which are available to and used by investors, I estimate investors' long-term internal growth rate expectations. To that long-term growth rate estimate, I add any additional growth that is attributable to investors' expectations regarding the on-going sale of stock for each of the companies under review.

Q. WHY HAVE YOU USED THE TECHNIQUE OF ANALYZING THE MARKET DATA OF SEVERAL COMPANIES?

A. I have used the "similar sample group" approach to cost of capital analysis because it yields a more accurate determination of the cost of equity capital than does the analysis of the data of one individual company. Any form of analysis in which the result is an estimate, such as growth in the DCF model, is subject to measurement error, i.e., error induced by the measurement of a particular parameter or by variations in the estimate of the technique chosen. When the technique is applied to only one observation (e.g., estimating the DCF growth rate for a single company) the estimate is referred to, statistically, as having "zero degrees of freedom." This means, simply, that there is no way of knowing if any observed change in the growth rate estimate is due to measurement error or to an actual change in the cost of capital. The degrees of freedom can be increased and exposure to measurement error reduced by applying any given estimation technique to a sample of companies rather than one single company. Therefore, by analyzing a group of firms with similar characteristics,

the estimated value (the growth rate and the resultant cost of capital) is more likely to equal the "true" value for that type of operation.

Q. HOW WERE THE FIRMS SELECTED FOR YOUR ANALYSIS?

A. In selecting a sample of electric utility firms to analyze, I screened all the electric utilities followed by Value Line, because that investor service, in addition to providing a wealth of historical data, provides projected information, which is important in gauging investor expectations. I selected electric companies that had at least 70% of revenues from electric operations, did not have a pending merger, did not have a recent dividend cut, had stable book values and a senior bond rating between "A-" and "BBB-." The screening process for electric utilities is displayed in DOD-206, attached to my testimony. The Companies selected for analysis are: Central Vermont Public Service (CV), FirstEnergy Corp. (FE), Northeast Utilities (NU), American Electric Power (AEP), Cleco Corp. (CNL), Empire District Electric (EDE), Entergy Corp. (ETR), Idacorp (IDA), Pinnacle West Capital Corp. (PNW), Unisource Energy (UNS), and Xcel Energy (XEL).[6] For those companies, on average, 88% of the revenue is generated by electric utility operations.

Q. WHY HAVE YOU ELECTED TO EXCLUDE HECO's PARENT COMPANY, HAWAIIAN ELECTRIC INDUSTRIES IN YOUR SAMPLE GROUP?

A. Although the parent company passed my screen, with revenues from electric operations greater than 70% of total revenues, and I included that firm in my analysis in Docket No. 06-0386, I have elected not to do so at this time. Even though HEI's banking operations have been relatively unscathed by recent financial events, the large market dislocation of the prior six months is due largely to problems in the financial industry. Therefore, in 2007 prior to the knowledge that the banking industry was in peril it was reasonable to believe that investors attributed only moderately higher risk to HEI's banking operations. Currently, following the events of last fall, it is reasonable to believe that investors would

[6] In the Schedules accompanying this testimony, the sample group companies are referred to by their stock ticker symbols, shown in parentheses here.

view a utility holding company with significant banking operations as different in risk from a regulated electric utility operation such as HECO. For that reason, I have not included HECO's parent company in my similar-risk sample of electric utility operations.

Q. HAS YOUR SELECTION PROCESS PRODUCED A SAMPLE GROUP THAT IS SIMILAR IN RISK TO HECO?

A. Yes, as I noted previously, my sample group has the same median financial and business risk characteristics as HEI, which has higher financial risk than HECO, due to its lower common equity ratio. Also the median bond rating of my sample group "BBB" and that of HECO are the same. Therefore, except for the fact that HECO has lower financial risk (a higher common equity ratio), which can be accounted for in the allowed return on common equity, my sample group provides a reasonable similar-risk proxy for determining the cost of common equity capital.

Q. HOW HAVE YOU CALCULATED THE DCF GROWTH RATES FOR THE SAMPLE OF COMPARABLE COMPANIES?

A. DOD 207, pages 1 through 4 shows the retention ratios, equity returns, sustainable growth rates, book values per share and number of shares outstanding for the comparable electric companies for the past five years. Also included in the information presented in DOD 207 are Value Line's projected 2009, 2010 and 2012-2014 values for equity return, retention ratio, book value growth rates and number of shares outstanding.[7]

In evaluating these data, I first calculate the five-year average sustainable growth rate, which is the product of the earned return on equity (r) and the ratio of earnings retained within the firm (b). For example, DOD 207, page 2, shows that the five-year average sustainable growth rate for American Electric Power (AEP) is 5.20%. The simple five-year average sustainable growth value is used as a benchmark for measuring the company's most recent growth rate trends. Recent growth rate trends are more investor-influencing than

[7] For some of the companies in the sample, the projections available from Value Line were through the 2011-2013 period.

simple historical averages. Continuing to focus on AEP, we see that sustainable growth in 2007 was slightly below the average growth for the five-year period, but overall the growth rate is relatively stable. By the 2011-2013 period, Value Line projects AEP's sustainable growth that is near the recent five-year average—5.2%. These forward-looking data indicate that investors expect AEP to grow at a rate in the future similar to the growth rate that has existed, on average, over the past five years.

At this point I should note that, while the five-year projections are given consideration in estimating a proper growth rate because they are available to and are used by investors, they are not given sole consideration. Without reviewing all the data available to investors, both projected and historic, sole reliance on projected information may be misleading. Value Line readily acknowledges to its subscribers the subjectivity necessarily present in estimates of the future:

> We have greater confidence in our year-ahead ranking system, which is based on proven price and earnings momentum, than in 3- to 5-year projections. (Value Line Investment Survey, Selection and Opinion, June 7, 1991, p.854).

Another factor to consider is that AEP's book value growth is expected to increase at a 6.0% level over the next five years, after showing 0% growth historically, as reported by Value Line using its three-year base period methodology.[8] This information would tend to increase growth rate expectations. However, this company has shed assets in recent years and the comparative increase in book value also indicates a return to more normal utility activity. Also, as shown on DOD 208, page 2, AEP's dividend growth rate, which was -9% historically, is expected to increase to a 4% rate of growth in the future—indicating an expectation for higher dividend growth, but growth that is below the sustainable growth projection. Earnings growth rate data available from Value Line indicate that investors can expect a growth rate in the future (5%), recovering from –0.5% rate of earnings growth

[8] Instead of calculating growth rates from one year to another, Value Line measures growth in per share data for one three-year based period to another three-year based period in order to reduce the influence of single-year results.

which has existed over the past five years, which approximates sustainable growth projections. IBES and Zack's (investor advisory services that poll institutional analysts for growth earnings rate projections) project slightly higher earnings growth rates for AEP—5.38% and 5.5%, respectively—over the next five years.

AEP's projected sustainable growth is about 5%, dividend growth is projected to average 4% and book value growth has been below that level in the past but is projected to be above that level in the future. Earnings growth projections range from 5% to 5.5%. The average of Value Line's projected earnings, dividend and book value growth projections for this company is 5%. A long-term sustainable growth rate of 5.0% is a reasonable expectation for AEP.

Q. IS THE INTERNAL (B X R) GROWTH RATE THE FINAL GROWTH RATE YOU USE IN YOUR DCF ANALYSIS?

A. No. An investor's sustainable growth rate analysis does not end upon the determination of an internal growth rate from earnings retention. Investor expectations regarding growth from external sources (sales of stock) must also be considered and examined. For AEP, page 2 of DOD-207 shows that the number of outstanding shares increased at a 0.34% rate over the most recent five-year period. Value Line expects the number of shares outstanding to increase somewhat more rapidly through the 2011-2013 period, bringing the share growth rate up to 0.9% by that time. An expectation of share growth of 0.5% is reasonable for this company.

As shown on page 1 of DOD-208, because AEP is currently trading at a market price that is slightly greater than book value, issuing additional shares will increase investors' growth rate expectations somewhat. Multiplying the expected growth rate in shares outstanding by (1-(Book Value/Market Value)), increases the long-term DCF growth rate for AEP by 4 basis points.[9]

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[9] As explained in DOD 202 attached to this testimony, according to Gordon's original DCF formula the factor that accounts for additional growth due to sales of stock is "s" the rate of increase in shares outstanding, times "v" the equity accretion rate, defined as (1-M/B). For the electric utilities under study, the "sv" term adds an additional 57 basis points to the DCF cost of equity capital.

I have included the details of my growth rate analyses for AEP as an example of the methodology I use in determining the DCF growth rate for each company in the electric industry sample. A description of the growth rate analyses of each of the companies included in my sample groups is set out in DOD 203. Also, DOD 208, page 1 attached to this testimony shows the internal, external and resultant overall growth rates for each of the electric utility companies analyzed.

Q. HAVE YOU CHECKED THE REASONABLENESS OF YOUR GROWTH RATE ESTIMATES AGAINST OTHER, PUBLICLY AVAILABLE, GROWTH RATE DATA?

A. Yes. Page 2 of DOD 208 shows the results of my DCF growth rate analysis as well as 5-year historic and projected earnings, dividends and book value growth rates from Value Line, earnings growth rate projections from IBES, the average of Value Line and IBES growth rates and the 5-year historical compound growth rates for earnings, dividends and book value for each company under study. Also shown are projected earnings growth rates from Zack's (another investor service that polls sell-side analysts for earnings growth projections).

My DCF growth rate estimate for all the electric utility companies included in my analysis is 4.90%. This figure is higher than Value Line's projected average growth rate in dividends for those same companies (4.14%) and is well above the five-year historical average earnings, dividend and book value growth rate reported by Value Line for those companies (2.11%). My growth rate estimate for the electric companies under review is below the earnings growth rate projection (7.45%-Value Line, 7.58% IBES, 6.3% Zack's).

Q. SOME ANALYSTS RELY EXCLUSIVELY ON ANALYSTS' EARNINGS PROJECTIONS AS THE GROWTH RATE IN THE DCF; YOU HAVE NOT DONE SO. CAN YOU EXPLAIN WHY?

A. In my view, earnings growth rate projections that are widely available are used by investors and, therefore, deserve consideration in an informed, accurate assessment of the investor expected growth rate to be included in a DCF model. I do not believe, however, that

projected earnings growth rates should be used as the *only* source of a DCF growth estimate as Company witness Morin has done in this case. In other words, projected earnings growth rates are influential in, but not determinative of, investor expectations.

First, it is important to realize that, as I discuss in Exhibit DOD-202, projected earnings growth rates may over- or understate the growth that can be sustained over time by the companies under review. This is important because long-term sustainable growth is required in an accurate DCF assessment of the cost of equity capital. The efficacy of projected earnings growth rates in any specific DCF analysis can only be determined through a study of the underlying fundamentals of growth—something that those who rely exclusively on analysts' earnings growth rate projections fail to do.

Second, the studies that support the use of analysts' earnings projections, measure the ability of analysts estimates to predict stock prices against simple historical averages of other parameters. In that sort of simplistic comparison, analysts' projections perform better. However, I am aware of no cost of capital analyst that relies exclusively on historical average growth rates, nor is it reasonable to believe that any astute investor would do so. Therefore, while studies do indicate that analysts' earnings growth estimates are better indicators of stock prices that are simple historical averages of other growth rate parameters, those studies do not provide any basis for exclusive reliance on earnings growth projections in a DCF analysis.

Third, as evidenced in headlines in the financial media in recent years, the sell-side institutional analysts that are polled by IBES and similar services offer relatively "rosy" expectations for the stock they follow—even when the analyst's actual expectations for the stock are not so sanguine. Simply put, some analysts overstate growth expectations to make the stocks the want to sell look better. Although claims are often made that the opinions of sell-side analysts are not affected by the profits made by the other parts of the business that actually trade those securities, the "Cinderella effect" (analysts' overstating stock expectations) is not a new phenomenon, and is recognized in academia. As the authors of a widely-used finance textbook note regarding the use of projected earnings growth rates in a DCF analysis:

> Estimates of this kind are only as good as the long-term forecasts on which they are based. For example, several studies have observed that security analysts are subject to behavioral biases and their forecasts tend to be over-optimistic [footnote]. If so, such DCF estimates of the cost of equity should be regarded as upper estimates of the true figure. [footnote : *See, for example,* A. Dugar and S. Nathan, "The Effect of Investment Banking Relationships on Financial Analysts' Earnings Investment Recommendations." (*Contemporary Accounting Research* 12 (1995), pp. 131-160.] (Brealey, Meyers, Allen, Principles of Corporate Finance, 8th Ed., McGraw-Hill Irwin, Boston, MA, (2006), p. 67.)

As Chan and Lakonishok note in "The Level and Persistence of Growth Rates," published in the *Journal of Finance* (Vol. LVIII, No. 2, April 2003, p. 643), "[t]here is no persistence in long-term earnings growth beyond chance, and there is low predictability even with a wide variety of predictor variables. Specifically, IBES growth forecasts are overly optimistic and add little predictive power." The concern regarding investors' use of analysts' growth estimates is also underscored by an investor's advisory service sponsored by the *Wall Street Journal*:

> "You should be careful when looking at analyst recommendations for several reasons. First of all, many analysts suffer from a conflict of interest between the firm that employs them and the company whose stock they track. Often times, an analyst will be responsible for issuing reports on a company that is a current or potential client of their employer (usually an investment bank). Since they know that their employer would like to keep the client's business, the analyst may be tempted to issue a rosier outlook for the stock than what it really deserves." (Investorguide.com, "University," Analysts and Earnings Estimates, www.investorguide.com/igustockanalyst.html)

Q. DOES THIS CONCLUDE THE GROWTH RATE PORTION OF YOUR DCF ANALYSIS?

A. Yes, it does.

Q. HOW HAVE YOU CALCULATED THE DIVIDEND YIELDS?

A. I have estimated the next quarterly dividend payment of each firm analyzed and annualized them for use in determining the dividend yield. If the quarterly dividend of any company was expected to be raised in the next quarter (2nd quarter of 2009), I increased the current quarterly dividend by (1+g). For the utility companies in the sample groups, a dividend adjustment was necessary for FirstEnergy, American Electric Power and Xcel Energy.

The next quarter annualized dividends were divided by a recent daily-average closing average stock price to obtain the DCF dividend yields. I use the most recent six-week period to determine an average stock price in a DCF cost of equity determination because I believe that period of time is long enough to avoid daily fluctuations and recent enough so that the stock price captured during the study period is representative of current investor expectations.

DOD-209 contains the market prices, annualized dividends and dividend yields of the utility companies under study. DOD-209 indicates that the average dividend yield for the sample group of electric companies is 5.11%. The year-ahead dividend yield projection for the electric utility sample group published by Value Line is also 5.4% (Value Line, *Summary & Index*, March 6, 2009). By that measure, my dividend yield calculation is generally representative of investor expectations, but may be somewhat understated.

Q. WHAT IS YOUR COST OF EQUITY CAPITAL ESTIMATE FOR THE ELECTRIC UTILITY COMPANIES, UTILIZING THE DCF MODEL?

A. DOD-210, shows that the average DCF cost of equity capital for the group of electric utilities is 10.01%.

Q. HAVE YOU ALSO PERFORMED A MULTI-STAGE DCF ANALYSIS IN THIS PROCEEDING?

A. Yes. While I do not normally employ a multi-stage DCF analysis in my estimation of the cost of equity capital because I believe it is unnecessary, in the substantial uncertainty of the current market environment, I believe it is reasonable to review the results of more estimates

of the cost of equity. A multi-stage DCF analysis is based on the same theory as the single-stage DCF, but selects particular growth rates for an initial growth and a final stage long-term growth rate, rather than estimating one long-term sustainable growth rate.[10]

In my experience, the multi-stage DCF analysis used most often in rate proceedings is one that uses analysts' earnings growth rate estimates as the first stage and a projected Gross Domestic Product nominal growth rate (based on the assumption that it is reasonable to assume that, over time, all firms will grow at a rate similar to that of the general economy) as the final stage long-term growth rate..

There are problems with both of those assumptions that tend to cause that type of multi-stage DCF to overstate the cost of equity. First, as I noted above, analysts' earnings growth rates tend to overstate actual growth rate results. That problem is less of a concern in a multi-stage DCF because it has less impact on the outcome than assuming analyst earnings growth estimates will continue indefinitely (the operative assumption in a single-stage, traditional DCF). Second, historical evidence indicates that utilities grow at a rate below that of the general economy.[11] Therefore, a multi-stage DCF that relies on GDP growth as the long-term growth rate is likely to overstate the cost of equity capital.

Setting aside those concerns, DOD-211 shows a multi-stage DCF analysis for all of the companies in my electric utility sample group. Averaging Value Line, IBES and Zack's earnings projections for each company provided the first stage growth rate. Using the 2009 dividend for each of those companies shown in DOD-209 as the first year dividend, I increased those annual dividends by one plus the average projected earnings growth rate for each company to determine the cash flows to the investor for the first five years.

Then for the second, long-term period I increased the dividend in each year by one plus the projected growth in Gross Domestic Product. The Congressional Budget Office's January 2009 expectation for long-term GDP growth is 4.2%. That is the growth rate for the second stage of the multi-stage DCF model, shown in DOD-211.

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[10] In some instances, analysts will insert a third growth rate stage in the calculation in which the initial growth rate is changed gradually to the final growth rate—a "transition" stage. This adjustment makes little difference in the outcome of the model.

[11] Moody's Public Utility Manual, 2001; GDP data from U. S. Dept. of Commerce (see DOD-205).

Then, using the current stock price of each company along with the projected cash flows just described, I used a spreadsheet Internal Rate of Return function to calculate the discount rate that would equate that stock price with the future cash flows. The result of that analysis is an average multi-stage DCF estimate of 9.62%. Given the fact that this is a relatively conservative analysis, i.e., produces results that tends to overstate the cost of equity, these results indicate that my standard DCF results are likely to be somewhat overstated.

B. CAPITAL ASSET PRICING MODEL

Q. PLEASE DESCRIBE THE CAPITAL ASSET PRICING MODEL (CAPM) YOU USED TO ARRIVE AT AN ESTIMATE FOR THE COST RATE OF THE COMPANY'S COMMON EQUITY CAPITAL.

A. The CAPM states that the expected rate of return on a security is determined by a risk-free rate of return plus a risk premium, which is proportional to the non-diversifiable (systematic) risk of a security. Systematic risk refers to the risk associated with movements in the macro-economy (the economic "system") and, thus, cannot be eliminated through diversification by holding a portfolio of securities. The beta coefficient (β) is a statistical measure that attempts to quantify the non-diversifiable risk of the return on a particular security against the returns inherent in general stock market fluctuations. The formula is expressed as follows:

$$k = r_f + \beta(r_m - r_f), \qquad (2)$$

where "k" is the cost of equity capital of an individual security, "r_f" is the risk-free rate of return, "β" is the beta coefficient, "r_m" is the average market return and "$r_m - r_f$" is the market risk premium. The CAPM is used in my analysis, not as a primary cost of equity analysis, but as a check of the DCF cost of equity estimate. Although I believe the CAPM can be useful in testing the reasonableness of a cost of capital estimate, certain theoretical

shortcomings of this model (when applied in cost of capital analysis) reduce its usefulness.

Q. CAN YOU EXPLAIN WHY THE CAPM ANALYSIS SHOULD NOT BE USED AS A PRIMARY ESTIMATE OF THE COST OF EQUITY CAPITAL?

A. Yes. The reasons why the CAPM should be used in cost of capital analysis carefully are set out below. It is important to understand that my caution with regard to the use of the CAPM in a cost of equity capital analysis does not indicate that the model is not a useful description of the capital markets. Rather, my caution recognizes that in the practical application of the CAPM to cost of capital analysis there are problems that can cause the results to be less reliable than other models.

For example, there has been much comment in the financial literature regarding the strength of the assumptions that underlie the CAPM and the inability to substantiate those assumptions through empirical analysis. Also, there are problems with the key CAPM risk measure, beta, that indicate that the CAPM analysis should not be used as a primary indicator of equity capital costs.

Cost of capital analysis is a decidedly forward-looking, or *ex-ante*, concept. Beta is not. The measurement of beta is derived with historical, or *ex-post*, information. Therefore, the beta of a particular company, because it is usually derived with five years of historical data, is slow to change to current (i.e., forward-looking) conditions, and some price abnormality that may have happened four years ago could substantially affect beta while, currently, being of little actual concern to investors. Also, this same shortcoming, which assumes that past results mirror investor expectations for the future plagues the market risk premium in an ex-post, or historically-oriented CAPM.

Q. WHAT VALUE HAVE YOU CHOSEN FOR A RISK-FREE RATE OF RETURN IN YOUR CAPM ANALYSIS?

A. As the CAPM is designed, the risk-free rate is the rate of return that investors can realize with certainty. The nearest analog in the investment spectrum is the 13-week U. S. Treasury Bill. However, T-Bills can be heavily influenced by Federal Reserve policy, as they have

been recently. While longer-term Treasury bonds have equivalent default risk to T-Bills, those longer-term government securities carry maturity risk that the T-Bills do not have. When investors tie up their money for longer periods of time, as they do when purchasing a long-term Treasury security, they must be compensated for future investment opportunities forgone as well as the potential for future changes in inflation. Investors are compensated for this increased investment risk by receiving a higher yield on T-Bonds. However, when T-Bills and T-Bonds exhibit a "normal" (historical average) spread of about 1.5%, the results of a CAPM analysis that appropriately matches a higher market risk premium with lower T-Bill yields or a lower market risk premium with higher T-Bond yields, are very similar.

As I noted in my previous discussion of the macro-economy, in an attempt to fend off a recession and to inject liquidity into the financial system, the Fed has acted vigorously since August of 2007 to lower short-term interest rates. Over the most recent six-week period, T-Bills have produced an average yield of only 0.25%. During that time period Treasury Bonds have been priced to yield 3.47% (data from Value Line *Selection & Opinion*, six most recent weekly editions (1/30/09-3/6/09)). According to the March 2, 2009 Federal Reserve Statistical Release H.15, long-term T-Bonds have yielded approximately 3.6% during February. Therefore, for purposes of analysis in this proceeding I will use the six-week average yield from Value Line, 3.47%, as the long-term risk-free rate.

Q. DO YOU BELIEVE THE USE OF A LONG-TERM TREASURY BOND RATE IS APPROPRIATE IN THE CAPM?

A. In the current economic environment, with short-term Treasury Bills yielding a near zero return, the use of a long-term Treasury bond would provide a more accurate indication of the risk-free return investors require and produces a more accurate estimate of investors' cost of equity. Therefore, in this testimony, I will present the CAPM cost of equity results using only long-term Treasury bond yields. With that measure of the risk-free rate, I use the corresponding measures of market risk premiums.

Q. WHAT MARKET RISK PREMIUM HAVE YOU USED IN YOUR CAPM ANALYSIS?

A. The market risk premium is the difference between the return investors expect on stocks and the return they expect on a risk-free rate of return like a U.S. Treasury bond. The "traditional" view, supported primarily by the earned return data over the past 80 years published by Morningstar (formerly Ibbotson), is based on the historical difference between the returns on stocks and the returns on bonds. That view assumes that the returns actually earned by investors over a long period of time are representative of the returns they expect to earn in the future.

For example, the Morningstar data show that investors have earned a return of 12.3% on stocks and 5.8% on long-term Treasury bonds since 1926.[12] Therefore, based on those historical data, it is assumed that investors will require a risk premium in the future of 6.5% above the long-term risk-free rate to invest in stocks [12.3% - 5.8% = 6.5%]. With a current long-term T-Bond yield of approximately 3.5%, that assumption indicates an investor expectation of a 10.5% return for the stock market in general [3.5% + 6.5% = 10.5%]. However, current research indicates that there are aspects of the Morningstar historical data set that, when examined, point not only to lower historical risk premiums than those reported by Morningstar, but expected risk premiums that are lower still.

Q. HAS THE RESEARCH YOU MENTION FOUND ITS WAY INTO TODAY'S FINANCE TEXTBOOKS?

A. Yes. In the 2006 edition of their widely-used finance textbook, Brealey, and Meyers[13] discuss the findings of many different recent studies regarding the market risk premium. Importantly, in prior editions of their textbooks Brealey, et al, cited the Morningstar historical data, now they do not. Instead, they cite the risk premium work of Dimson, Staunton and Marsh, authors of "Triumph of the Optimists," in which those authors review a longer-term data set than that used by Morningstar (which indicates a lower historical

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[12] Morningstar, SBBI Valuation Edition, 2007 Yearbook, p. 28.

[13] Brealey, R., Meyers, S., Allen, F., Principles of Corporate Finance, 8th Edition, McGraw-Hill, Irwin, Boston MA, 2006.

average market risk premium) and conclude, further, that market risk premiums expected in the future are below historical averages.[14]

The textbook authors conclude, based on a review of the recent evidence regarding the market risk premium, that a reasonable range of equity premiums above short-term Treasury Bills is 5% to 8%.[15] Because, the long-term historical difference in the return between T-Bonds and T-Bills has been 1.2%, Brealey and Meyers' textbook indicates a long-term market risk premium relative to T-Bonds ranging from 3.8% to 6.8% [5% - 1.2% = 3.8%; 8% - 1.2% = 6.8%].[16] The mid-point of that 3.8% to 6.8% long-term risk premium range is 5.3%. Although 5.3% is higher than other risk premium estimates discussed in recent research, that average market risk premium added to a current T-Bond yield of 3.5%, would produce a current equity return expectation for U.S. equities of 8.8%. Because utility stocks are less risky than the market as a whole, an appropriate return on equity for utilities would be lower, according to CAPM theory.

Q. WHAT HAVE YOU CHOSEN AS THE MARKET RISK PREMIUM FOR THE CAPM ANALYSIS?

A. In their 2007 edition of Stocks, Bonds, Bills and Inflation, Morningstar indicates that the average market risk premium between stocks and T-Bills over the 1926–2006 time period is 6.5% (based on an arithmetic average), and 5.0% (based on a geometric average). I have, in prior testimony, used these values as a range of estimates for the market risk premium in the CAPM analysis.

As I have noted above, recent research in the field of financial economics has shown that the market risk premium data published by Morningstar overstates investor-expected market risk premiums. Brealey & Meyers' most recent finance textbook indicates that the long-term arithmetic average market risk premium ranges from 3.8% to 6.8%—reaching much lower levels than the Morningstar data indicates. The mid-point of Brealey &

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[14] Dimson, E., Staunton, M., March, P., Triumph Of The Optimists, 101 Years of Global Investment Returns, Princeton University Press, Princeton, NJ, 2002.

[15] Op cit, p. 154.

[16] Op cit, pp. 149, 222.

Meyer's long-term arithmetic risk premium range is 5.3%, which falls within the 5% to 6.5% range published by Morningstar. For purposes of determining the CAPM cost of equity in this proceeding I will also use the mid-point of the long-term risk premium range set out in the most recent Brealey & Meyer's text—5.3%, as well as the Morningstar market risk premiums to develop a range of CAPM equity cost estimates.

Q. WHAT VALUES HAVE YOU CHOSEN FOR THE BETA COEFFICIENTS IN THE CAPM ANALYSIS?

A. Value Line reports beta coefficients for all the stocks it follows. Value Line's beta is derived from a regression analysis between weekly percentage changes in the market price of a stock and weekly percentage changes in the New York Stock Exchange Composite Index over a period of five years. The average beta coefficient of the sample of electric companies is 0.72.

Q. WHAT IS YOUR RECOMMENDED COST OF EQUITY CAPITAL FOR THE SAMPLE OF ELECTRIC COMPANIES USING THE CAPITAL ASSET PRICING MODEL ANALYSIS?

A. DOD-212, shows that the average Value Line beta coefficient for the group of electric companies under study is 0.72. The mid-point of the range of market risk premiums published by Brealey and Meyers of 5.3% would, upon the adoption of a 0.72 beta, become a electric utility sample group premium of 3.83% (0.72 x 5.3%). That non-specific risk premium added to the recent average T-Bond rate of 3.47% yields a common equity cost rate estimate of 7.30%. Using the historical arithmetic average market risk premiums published by Morningstar (6.5%) the resulting CAPM equity cost estimate for the electric companies would be 8.17%.

The CAPM results are substantially below the standard DCF results, previously derived, and provide another indication that the cost of equity capital may be below that indicated by the DCF results.

C. MODIFIED EARNINGS-PRICE RATIO ANALYSIS

Q. PLEASE DESCRIBE THE MODIFIED EARNINGS-PRICE RATIO (MEPR) ANALYSIS OF THE COST OF COMMON EQUITY CAPITAL.

A. One portion of this analysis is the earnings-price ratio, which is simply the expected earnings per share divided by the current market price. In cost of capital analysis, the earnings-price ratio alone can be useful in a corroborative sense, since it can be a good indicator of the proper range of equity costs when the market price of a stock is near its book value. When the market price of a stock is *above* its book value, the earnings-price ratio *understates* the cost of equity capital. DOD-213 contains mathematical proof for this concept. The opposite is also true, i.e.; the earnings-price ratio *overstates* the cost of equity capital when the market price of a stock is *below* book value.

Under current market conditions, the utilities under study have an average market-to-book ratio of 1.13 and, therefore, the average earnings-price ratio alone will understate, slightly, the cost of equity for the sample groups. However, I do not use the earnings-price ratio alone as an indicator of equity capital cost rates. Because of the relationship among the earnings-price ratio, the market-to-book ratio and the investor-expected return on equity described mathematically in DOD-213, I have modified the earnings-price ratio analysis by including projected equity returns for the companies under study. It is that modified analysis that I will use to assist in estimating an appropriate range of equity capital costs in this proceeding.

Q. PLEASE EXPLAIN THE RELATIONSHIP AMONG THE EARNINGS-PRICE RATIO, THE EXPECTED RETURN ON EQUITY, AND THE MARKET-TO-BOOK RATIO.

A. When the expected return (ROE) approximates the cost of equity, the market price of the utility approximates its book value and the earnings-price ratio provides an accurate estimate of the cost of equity. As the investor-expected return on equity for a utility (ROE) begins to exceed the cost of equity capital, the market price of the firm will tend to exceed its book value. As explained above, when the market price exceeds book value, the earnings-price

ratio understates the cost of equity capital. Therefore, when the expected equity return (ROE) exceeds the cost of equity capital, the earnings-price ratio will understate that cost rate. Also, in situations where the expected equity return is below what investors require, market prices fall below book value. Further, when market-to-book ratios are below 1.0, the earnings-price ratio overstates the cost of equity capital. Thus, the expected rate of return on equity and the earnings-price ratio tend to move in a countervailing fashion around a central locus, which is the cost of equity capital. Therefore, the average of the expected book return and the earnings price ratio provides a reasonable estimate of the cost of equity capital.

These relationships represent general rather than precisely quantifiable tendencies but are useful in corroborating other cost of capital methodologies. The Federal Energy Regulatory Commission, in its generic rate of return hearings, found this technique useful and indicated that under the circumstances of market-to-book ratios exceeding unity, the cost of equity is bounded above by the expected equity return and below by the earnings-price ratio (e.g., 50 Fed Reg, 1985, p. 21822; 51 Fed Reg, 1986, pp. 361, 362; 37 FERC ¶ 61,287). The mid-point of these two parameters, therefore, produces an estimate of the cost of equity capital which, when market-to-book ratios are different from unity, is far more accurate than the earnings-price ratio alone.

Q. IS THERE THEORETICAL SUPPORT FOR THE USE OF AN EARNINGS-PRICE RATIO IN CONJUNCTION WITH AN EXPECTED RETURN ON EQUITY AS AN INDICATOR OF THE COST OF EQUITY CAPITAL?

A. Elton and Gruber, Modern Portfolio Theory and Investment Analysis (New York University, Wiley & Sons, New York, 1995, pp. 401-404) provides support for reliance on the modified earnings price ratio analysis.

The Elton and Gruber text posits the following formula,

$$k = (1-b)E/(1-cb)P, \text{ where} \qquad (3)$$

"k" is the cost of equity capital, "b" is the retention ratio, "E" is earnings, "P" is market price and "c" is the ratio of the expected return on equity to the cost of equity capital (ROE/k). This formula shows that when ROE = k, "c" equals 1.0 and the cost of equity capital equals the earnings-price ratio. Moreover, in that case, ROE is greater than "k" (as it is in today's market), "c" is greater than 1.0 and the earnings-price ratio will understate the cost of equity. Also, the more that ROE exceeds "k" the more the earnings price ratio will understate "k." In other words, as I noted earlier, those two parameters, the earnings-price ratio and the expected return on equity (ROE) orbit around the cost of equity capital, with the cost of equity as the locus, and fluctuate so that their mid-point approximates the cost of equity capital.

Assuming an industry average retention ratio of about 30% (i.e., 70% of earnings are paid out as dividends), the stochastic relationship between the expected return (ROE) and the earnings price ratio can be determined from Equation (3), above, as shown in Table II below. Most importantly, Equation (3) shows that the average of the EPR and ROE (which is my MEPR analysis) will approximate "k", the cost of equity capital.

Table II.

SUPPORT FOR THE MODIFIED EARNINGS PRICE RAITO ANALYSIS

Cost of Equity	Retention Ratio	ROE	ROE/k	Earnings Price Ratio	M.E.P.R. (ROE+EPR)/2
[1]	[2]	[3]	[4]=[3]/[1]	[5]	[6]=([3]+[5])/2
10.00%	35.00%	13.00%	1.3	8.38%	10.69%
10.00%	35.00%	12.00%	1.2	8.92%	10.46%
10.00%	35.00%	11.00%	1.1	9.46%	10.23%
10.00%	35.00%	10.00%	1.0	10.00%	10.00%
10.00%	35.00%	9.00%	0.9	10.54%	9.77%
10.00%	35.00%	8.00%	0.8	11.08%	9.54%
10.00%	35.00%	7.00%	0.7	11.62%	9.31%

[5] From Equation (3): E/P = k(1-cb)/(1-b)

As the data in Table II shows, the average of the expected return (ROE) and the earnings price ratio (EPR) produces an MEPR estimate of the cost of common equity capital of sufficient accuracy to serve as a check of other analyses, which is how I use the model in my testimony.

Q. WHAT ARE THE RESULTS OF YOUR EARNINGS-PRICE RATIO ANALYSIS OF THE COST OF EQUITY FOR THE SAMPLE GROUP?

A. Exhibit DOD-214 shows the IBES projected 2010 per share earnings for each of the firms in the sample groups. Recent average market prices (the same market prices used in my DCF analysis), and Value Line's projected return on equity for 2009 and 2011-2013 for each of the companies are also shown.

The average earnings-price ratio for the electric sample group, 9.02%, is somewhat below the cost of equity for those companies due to the fact that their average market-to-book ratio is currently above unity (average electric utility M/B = 1.13). The sample electric companies' 2009 book equity return averages 10.27%, which is somewhat above the current cost of equity for those companies, according to the assumptions on which the MEPR is based. For the electric sample group, then, the near-term, mid-point of the earnings-price ratio and the current equity return is 9.65%.

DOD-214, also shows that the average expected book equity return for the electric utilities over the next three- to five-year period remains at 10.27%. The midpoint of that long-term projected return on book equity and the current earnings-price ratio is, of course, the same 9.65%. Those MEPR results are below the cost of equity estimate provided by the standard DCF.

D. MARKET-TO-BOOK RATIO ANALYSIS

Q. PLEASE DESCRIBE YOUR MARKET-TO-BOOK (MTB) ANALYSIS OF THE COST OF COMMON EQUITY CAPITAL FOR THE SAMPLE GROUPS.

A. This technique of analysis is a derivative of the DCF model that attempts to adjust the

capital cost derived with regard to inequalities that might exist in the market-to-book ratio. This method is derived algebraically from the DCF model and, therefore, cannot be considered a strictly independent check of that method. However, the MTB analysis can be useful in a corroborative sense. The MTB seeks to determine the cost of equity using market-determined parameters in a format different from that employed in the DCF analysis. In the DCF analysis, the available data is "smoothed" to identify investors' long-term sustainable expectations. The MTB analysis, while based on the DCF theory, relies instead on point-in-time data projected one year and five years into the future and, thus, offers a practical corroborative check on the traditional DCF. The MTB formula is derived as follows:

Solving for "P" from Equation (1), the standard DCF model, we have

$$P = D/(k-g). \qquad (4)$$

But the dividend (D) is equal to the earnings (E) times the earnings payout ratio, or one minus the retention ratio (b), or

$$D = E(1-b). \qquad (5)$$

Substituting Equation (5) into Equation (4), we have

$$P = \frac{E(1-b)}{k-g} . \qquad (6)$$

The earnings (E) are equal to the return on equity (r) times the book value of that equity (B). Making that substitution into Equation (6), we have

$$P = \frac{rB(1-b)}{k-g} . \qquad (7)$$

Dividing both sides of Equation (7) by the book value (B) and noting from Equation (ii) in Exhibit DOD-202 that g = br+sv,

$$\frac{P}{B} = \frac{r(1-b)}{k-br-sv} \cdot \qquad (8)$$

Finally, solving Equation (8) for the cost of equity capital (k) yields the MTB formula:

$$k = \frac{r(1-b)}{P/B} + br + sv. \qquad (9)$$

Equation (9) indicates that the cost of equity capital equals the expected return on equity multiplied by the payout ratio, divided by the market-to-book ratio plus growth. DOD-215 shows the results of applying Equation (9) to the defined parameters for the electric utility firms in the comparable sample. For the electric utility sample group, page 1 of DOD-215 utilizes current year (2009) data for the MTB analysis while page 2 utilizes Value Line's 2011-2013 projections (or 2012-2014 projections, where available).

The MTB cost of equity for the sample of electric utility firms, recognizing a current average market-to-book ratio of 1.13 is 9.82% using the current year data and 9.66% using projected three- to five-year data. The average of those point-in-time estimates, about 9.7%, is also below my standard DCF equity cost estimate for electric utilities.

E. SUMMARY

Q. PLEASE SUMMARIZE THE RESULTS OF YOUR EQUITY CAPITAL COST ANALYSES FOR THE SAMPLE GROUP OF SIMILAR-RISK ELECTRIC UTILITY COMPANIES.

A. My analysis of the cost of common equity capital for the sample group of electric utility companies is summarized in the table below.

Table III.

Equity Cost Estimates

METHOD	Electric Utility Companies
DCF	10.01%
Multi-DCF	9.62%
CAPM	7.09%/8.17%
MEPR	9.65%/9.65%
MTB	9.66%/9.82%

For the electric utility sample group, the DCF result is 10.01%. Also, as I noted previously, the dividend yield portion of that DCF calculation is somewhat understated compared to Value Line's current year-ahead projections. However, the multi-stage DCF results, using the Congressional Budget Office's projected growth in GDP as the final long-term growth rate indicates a lower cost of equity. In addition, the corroborating cost of equity indications (MEPR, MTB, and CAPM)[17], also provide an indication that my DCF result is overstated. Averaging the lowest and highest results of all the corroborative analyses for the electric companies produces an equity cost range of 8.80% to 9.21%, with a mid-point of 9.0%, more than 100 basis below the single-stage DCF result.

While the results of these analyses are widely dispersed, I believe, due to the unusual nature of the current economic environment, they indicate that the cost of equity capital for the utility sample group is most likely to lie below the standard DCF results for those companies. Moreover, while the CAPM results, especially at the low end, are not likely to represent long-run investor equity return expectations, they should not be disregarded. Those CAPM results are based on widely-accepted theory and observable risk-free rates of return, and provide an indication that the current cost of equity is lower than that represented by the DCF. Therefore, weighing all the evidence presented herein,

[17] I do not include the multi-stage DCF result in the calculation of corroborative analyses, because it is a cost of capital methodology I do not normally use in my analysis.

my best estimate of the cost of equity capital for a company like HECO, facing similar risks as this group of electric utilities, ranges from 9.25% to 10.25%, with a mid-point of 9.75%.

Q. DOES YOUR EQUITY COST ESTIMATE INCLUDE AN INCREMENT FOR FLOTATION COSTS?

A. No. My equity cost estimate does not contain an explicit adjustment for costs associated with public issuances of common stock, which are commonly referred to as flotation costs.

Q. CAN YOU PLEASE EXPLAIN WHY AN EXPLICIT ADJUSTMENT TO THE COST OF EQUITY CAPITAL FOR FLOTATION COSTS IS UNNECESSARY?

A. An explicit adjustment to "account for" flotation costs is unnecessary for several reasons. First, it is often said that flotation costs associated with common stock issues are exactly like flotation costs associated with bonds. That is not a correct statement because bonds have a fixed cost and common stock does not. Moreover, even if it were true, the current relationship between the electric utility sample group's stock price and its book value would indicate a flotation cost reduction to the market-based cost of equity, not an increase.

When a bond is issued at a price that exceeds its face (book) value, and that difference between market price and the book value is greater than the flotation costs incurred during the issuance, the embedded cost of that debt (the cost to the company) is *lower* than the coupon rate of that debt.

In the current economic environment for the electric utility common stocks studied to determine the cost of equity in this proceeding, those stocks are selling at a market price 13% above book value. (DOD-207, p. 1) The difference between the market price of electric utility stock and book value is larger than any issuance expense the companies might incur. If common equity flotation costs were considered to be like flotation costs with bonds and if an explicit adjustment to the cost of common equity were, therefore necessary, then the adjustment should be downward, not upward.

Second, flotation cost adjustments are usually predicated on the prevention of the dilution of stockholder investment. However, the reduction of the book value of stockholder

investment due to issuance expenses can occur only when the utility's stock is selling at a market price at or below its book value. As noted, the companies under review are selling at a substantial premium to book value. Therefore, every time a new share of that stock is sold, existing shareholders realize an *increase* in the per share book value of their investment. No dilution occurs, even without any explicit flotation cost allowance.

Third, the vast majority of the issuance expenses incurred in any public stock offering are "underwriter's fees" or "discounts." Underwriter's discounts are not out-of-pocket expenses for the issuing company. On a per share basis, they represent only the difference between the price the underwriter receives from the public and the price the utility receives from the underwriter for its stock. As a result, underwriter's fees are not an expense incurred by the issuing utility and recovery of such "costs" should not be included in rates.

In addition, the amount of the underwriter's fees are prominently displayed on the front page of every stock offering prospectus and, as a result, the investors who participate in those offerings (e.g., brokerage firms) are quite aware that a portion of the price they pay does not go to the company but goes, instead, to the underwriters. By electing to buy the stock with that understanding, those investors have effectively accounted for those issuance costs in their risk-return framework by paying the offering price. Therefore, they do not need any additional adjustments to the allowed return of the regulated firm to "account" for those costs.

Fourth, research has shown that a specific adjustment for issuance expenses is unnecessary.[18] There are other transaction costs which, when properly considered, eliminate the need for an explicit issuance expense adjustment to equity capital costs. The transaction cost that is improperly ignored by the advocates of issuance expense adjustments is brokerage fees. Issuance expenses occur with an initial issue of stock in a primary market offering. Brokerage fees occur in the much larger secondary market where pre-existing shares are traded daily. Brokerage fees tend to increase the price of the stock to the investor

[18] "A Note on Transaction Costs and the Cost of Common Equity for a Public Utility," Habr, D., National Regulatory Research Institute Quarterly Bulletin, January 1988, pp. 95-103.

to levels above that reported in the Wall Street Journal, i.e., the market price analysts use in a DCF analysis. Therefore, if brokerage fees were included in a DCF cost of capital estimate they would raise the effective market price, lower the dividend yield and lower the investors' required return. Under a symmetrical treatment, if transaction costs that, supposedly, raise the required return (issuance expenses) are included, then those costs that lower the required return (brokerage fees) should also be included. As shown by the research noted above, those transaction costs essentially offset each other and no specific equity capital cost adjustment is warranted.

Q. IF THE COMMISSION APPROVED THE COMPANY'S REQUEST FOR A 30 BASIS POINT ADDITION TO THE COST OF EQUITY IN THIS PROCEEDING HOW MUCH WOULD IT COST HECO's HAWAII RATEPAYERS EVERY YEAR?

A. Using a DOD-recommended rate base of approximately $1.3 Billion, and a ratemaking equity ratio of 54.3%, a 30 basis point addition to the allowed return on common equity will cost HECO's Hawaii ratepayers $3.4 Million annually. [$1.3 Billion x 54.3% x 0.30% ÷ (1-38%) = $3.41 Million] That is an unnecessary expense that would, in effect, be an economically inefficient tax on ratepayers.

Also, in order for the Company to actually incur flotation cost of $4.4 Million annually (assuming that such costs are 5% of any equity offering), HEI would have to issue $68 Million in common equity every year [$68 Mill. X 5% = $3.4 Mill.], infuse that common equity to HECO, and assign the flotation costs to HECO. However, that scenario of external equity infusions does not appear in the 5-year financial projections provided by the Company in DOD-IR-9. Simply put, allowing an increase in the cost of equity for flotation costs would cause the Company's ratepayers to shoulder costs that the Company, itself, does not expect to incur.

Q. ARE THERE OTHER FACTORS TO BE CONSIDERED BEFORE DETERMINING A POINT-ESTIMATE FOR HECO'S UTILITY OPERATIONS?

A. Yes, the capital structure I recommend for ratesetting purposes for HECO contains a 54.3% common equity ratio. The average common equity ratio for my sample group of electric companies used to estimate the cost of equity is 44%. On that basis, HECO has lower financial risk than the sample group and a return below the mid-point of the range would be appropriate.

Q. IS THERE A RECOGNIZED METHOD WITH WHICH DIFFERENCE IN FINANCIAL RISK CAN BE QUANTIFIED?

A. Yes. The impact of debt leverage on the cost of equity capital can be approximated through an examination of the changes in beta, which occurs when leverage is increased or decreased. The Value Line betas for the sample companies used in my cost of capital analysis in this proceeding reflect the market's (investors') perception of both the business risks and the financial risks of a firm. That is, one portion of the beta of a firm is related to the business risk of the firm (the risk inherent in its operations) and one portion of the beta is related to the financial risk of that firm (the risk associated with the use of debt). Therefore, if a firm elects to finance its operations with debt as well as equity, the beta coefficient of that firm will reflect both the business and financial risk. When a firm uses debt to finance its operations, the beta can also be referred to as a "levered" beta (i.e., a beta coefficient that includes the impact of debt leverage).

The average beta coefficient of the sample group of utilities can be "unlevered." That is, the beta-risk related to the level of debt capital used by the firm can be removed. "Unlevering the betas" amounts to estimating what the average beta would be if the companies were financed entirely with equity capital. Equation (10), below, is used to estimate the unlevered beta for a firm or a group of similar-risk firms.[19]

$$\beta_U = \frac{\beta_{Measured}}{(1+(1-t)D/E)} \qquad (10)$$

[19]Equation (1) is a version of the Hamada equation which combines the Miller-Modigliani theories regarding capital structure and the logic of the CAPM: Hamada, R.S., "Portfolio Analysis, Market equilibrium and Corporation Finance," *Journal of Finance*, March 1969, pp. 13-31.

Equation (10) indicates that an estimate of the unlevered beta (β_U) of a firm can be calculated by dividing the measured beta ($\beta_{Measured}$, e.g. the beta coefficient reported by investor services such as Value Line) by one plus the average debt-to-equity ratio, adjusted to account for taxes. In this analysis, the debt-to-equity ratio is measured using the average market value of the sample group's common equity capital. Once the unlevered beta for the firm (or, in this case, for the sample group of market-traded utility companies) is calculated, the beta coefficient is "re-levered" to conform to the less-leveraged capital structure I recommend for HECO. The formula used to "re-lever" the utility betas is shown below.

$$\beta_{Relevered} = \beta_U(1+ (1-t)D/E) \qquad (11)$$

Equation (11) states that the relevered beta equals the unlevered beta (β_U) multiplied times one plus the target debt-to-equity ratio (in this case HECO's ratemaking capital structure—54.3% equity/45.7% fixed-income capital), again adjusted for taxes.

Exhibit DOD-216 shows that, the average capital structure of the sample group of electric companies used to estimate the cost of equity capital in my direct testimony consists of 42.91% common equity and 57.09% fixed-income capital. That capital structure, adjusted to market levels by an average 1.13 market-to-book ratio and accounting for a 35% tax rate, produces an average value for (1-t)D/E in Equation (10) of 0.78.

DOD-216 shows further that the measured (average Value Line) beta coefficient of the sample group of electric utility firms is 0.72, and the unlevered beta coefficient of those firms (i.e., what the average beta would be if those firms were financed entirely with common equity) is 0.40. When that beta is "relevered" using the methodology described above to conform to HECO's ratemaking capital structure, the resulting beta coefficient is 0.61. Thus, the re-levered beta is 11 basis points lower than that of the sample group.

Finally, with the decrease in beta determined, the CAPM can be used to estimate the impact of that adjustment on the cost of capital. A review of the CAPM equation (Equation (2)) shows that the beta coefficient is multiplied by the market risk premium ($r_m - r_f$) as a step in the determination of the cost of capital. Therefore, it is possible to measure the

impact of an adjustment to beta by multiplying the difference in the measured and relevered betas of the electric companies by the market risk premium.

As I noted in my discussion of the CAPM analysis, the long-term historical market risk premium provided by Ibbotson Associates' historical database ranges from 5% to 6.5%. I also discuss the fact that the most recent research indicates that the Ibbotson historical risk premium data overstate investor expectations, therefore, the lower portion of that range would provide a more reasonable estimate of the equity cost impact.

As shown in DOD-216, a decrease in the average beta coefficient of 0.11 attributed to HECO's lower financial risk, multiplied by a market risk premium ranging from 5% to 6.5%, indicates a decrease in the cost of equity capital due to reduced leverage at HECO of 57 to 74 basis points.

The reasonable range of the current cost of common equity for the electric utility sample group, presented previously is 9.25% to 10.25%, with a mid-point of 9.75% signifying a firm of average risk in that sample. The capital structure risk analysis in DOD-216 indicates that, with a change in the common equity ratio from a group-average 44% to 54%, the cost of capital for HECO should be below 9.75%. In other words, the calculated increment for lower financial risk, if applied to the mid-point of the range, would put the resulting cost of equity approximately 50 basis points below the mid-point of the range. Therefore, in order to account for the differences in financial risk between the electric utilities in my sample group and HECO's ratemaking capital structure, and to recognize that beta is an imperfect measure of risk, a cost of equity near the lower end of a reasonable range would be appropriate. For purposes of ratesetting in this case, I recommend a more moderate 25 basis point decrement for reduced financial risk, and an allowed return on equity of 9.50% for HECO.

Q. IS THERE EVIDENCE IN THE RECORD IN THIS PROCEEDING THAT SUPPORTS THE REASONABLENESS OF YOUR EQUITY RETURN RECOMMENDATION FOR HECO?

A. Yes. In its 2008 Annual Report (pp. 114-116), HECO's parent company, HEI, indicates

that it has approximately $1 Billion invested in its pension fund, approximately 70% of which is equity and 30% of which is debt. On that mix of investments, HEI indicates to investors that it expects to earn a long-term return of 8.25%. Based on similar language published in its 2007 Annual Report, DOD requested that the Company provide the long-term return assumptions for each asset class of investments included in its retirement fund portfolio (e.g., equities, debt, etc.). The long-term return expectation in 2007 was slightly higher at 8.50%.

In response to DOD-IR-11, HECO provided the requested data, which is designated confidential. While not citing the response directly, the equity return expectation reported by HECO supports the reasonableness of my equity return recommendation in this proceeding. That is because the long-term rate of return HECO expects on its own equity investments is similar to my equity cost estimate in this proceeding.

Some utility companies do not consider their own equity return expectations confidential and publish that data for investors to review in their S.E.C. filings. For example, Northeast Utilities, a company included in my similar-risk sample group, at page 53 of its 2008 S.E.C. Form 10-K indicates that its long-term return expectation for the common equity portion of its pension fund investments is 9.25%. Importantly, that return is for common stocks, generally, not utility stocks, which are less risky and would be expected to carry a lower return expectation.

The purpose of a cost of equity analysis is to use market data to estimate what return investors expect on common stocks over the long term. With the long-term equity return expectations evidenced in utility pension fund return expectations, we have similar evidence, not from an economic model of investor behavior, but from investors themselves. If an equity return expectation of 9.25% for the stock market, generally, is reasonable, then a equity cost estimate for HECO of 9.50% is certainly so, if not overly conservative.

Q. MR. HILL, ISN'T IT REASONABLE TO BELIVE THAT EQUITY RETURN EXPECTATIONS FOR PENSION FUNDS ARE CONSERVATIVE (LOW) IN ORDER TO NOT OVERESTIMATE FUTURE RETURNS AND, THUS, UNDER-ESTIMATE CURENT FUNDING REQUIREMENTS?

A. Yes, however, just as the firm would not want to over-estimate the future equity return, it would not want to under-estimate the pension fund return either. Underestimating the long-term return would call for an unnecessarily high annual contribution every year to reach the future targeted amount of pension funds. That large current annual pension expense, would unnecessarily reduce current profitability. It is not reasonable to believe that any firm's management team would purposefully depresses current profitability by underestimating pension fund returns. Thus, the negative consequences of under-estimating long term asset returns in a pension fund portfolio prevent those estimates from being too conservative. In addition, if ultimate returns turn out to be consistently higher than predicted through under-estimating the expected portfolio return, the firm will, effectively, have funded its pension requirements with internally-generated funds that could have been put to other more immediate corporate uses.

Therefore, because there are negatives associated with either over- or under-estimating expected pension portfolio equity returns, it is reasonable to assume that prudent management seeks to accurately estimate its expected investment returns. That is why management hires and pays its pension fund managers, and it believes that, over the long-term, the common equity return expectations for its pension fund investments are in the range, cited above, and not something more. Therefore, HECO's own long-term return expectations for its own equity investments support my 9.5% equity return recommendation for HECO.

Q. WHAT IS THE OVERALL COST OF CAPITAL FOR HECO'S ELECTRIC UTILITY OPERATIONS, BASED ON AN ALLOWED EQUITY RETURN OF 9.50%?

A. DOD-217 attached to my testimony shows that an equity return of 9.50%, operating through the Company's requested capital structure of 54.30% common equity, 4.05%

preferred stock, 1.89% hybrid securities, 38.27% long-term debt, and 1.49% short-term debt produces an overall return of 7.84% for HECO. DOD-217 also shows that a 7.84% overall cost of capital affords the Company an opportunity to achieve a pre-tax interest coverage level of 4.71 times.

According to HECO's 2008 S.E.C. Form 10-K (Exhibit 12), the pre-tax interest coverage over the past five years has averaged 3.15x and has ranged from 3.49x to 2.43x. The return I recommend would allow the Company the opportunity to improve its historical interest coverage. Therefore, the equity return I recommend fulfills the legal requirement of Hope and Bluefield of providing the Company the opportunity to earn a return which is commensurate with the risk of the operation and serves to support and maintain the Company's ability to attract capital.

IV. COMMENTS ON COMPANY COST OF CAPITAL TESTIMONY

A. TECHNICAL ISSUES

Q. PRIOR TO ADDRESSING THE DETAILS OF EACH OF DR. MORIN'S EQUITY COST ESTIMATION METHODS, ARE THERE TECHNICAL ASPECTS OF HIS ANALYSES THAT CAUSE HIS RESULTS TO BE OVERSTATED?

A. Yes. There are aspects of each of Dr. Morin's individual equity cost analyses that cause the results to be overstated to varying degrees, which I will discuss below when I address each of those methods in detail. However, there are two unnecessary adjustments applied by Dr. Morin to each equity cost estimate that cause his average ROE results to be overstated by approximately 38 basis points (0.38%). Those adjustments are a dividend yield adjustment and a flotation cost adjustment.

Dr. Morin's Direct Testimony and Exhibits indicate that he has added flotation costs to the equity cost estimates he presents. His flotation cost increases his recommended

return on equity by 26 basis points, on average.[20] As I explained previously an explicit adjustment for flotation costs is unnecessary. Removing that unnecessary 26 basis point adjustment from Dr. Morin's average equity cost estimate for HECO indicates an average equity cost estimate of 10.74 percent, not the 11.0 percent reported at page 51 of Dr. Morin's Direct Testimony [11.0% - 0.26% = 10.74%].

Q. IN ADDITION TO THE FLOTATION COST ADJUSTMENT, WHAT IS THE SECOND UNNECESSARY ADJUSTMENT IN DR. MORIN'S EQUITY COST ESTIMATES?

A. Dr. Morin's DCF analysis relies on dividend yields published in Value Line. I have no concerns with the use of Value Line as a source of information. In calculating his DCF dividend yields, however, Dr. Morin increases the current dividend yield by one plus the DCF growth rate. As Value Line explains to the investors' that use its service in "A Subscribers' Guide," the dividend yield published by Value Line, is based on the "cash dividends *estimated to be declared in the next 12 months* divided by the recent [stock] price." Therefore, in adjusting the dividend yield published by Value Line for one year's expected growth, Dr. Morin is double-counting that growth.

As shown on Dr. Morin's Exhibits HECO-1904 through HECO-1907, his dividend growth adjustment (1+g) increases the DCF cost of equity capital from 20 to 30 basis points. Because the reported Value Line dividend is already adjusted for expected growth, this represents an overstatement of the overall cost of equity of approximately 12 basis points because DCF analyses represent 4 of Dr. Morin's 8 equity estimation methods [25 basis points x 4 ÷ 8 = 12.5].

That 12 basis point overstatement caused by double-counting the dividend increase, combined with the inclusion of an unnecessary 26 basis point flotation cost adjustment causes Dr. Morin's equity cost estimates to be overstated by approximately 38 basis points. Therefore Dr. Morin's equity cost analyses, absent unnecessary upward adjustments

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[20] Seven of Dr. Morin's eight cost of equity estimates are adjusted upward by 30 basis points for flotation, (7 x 30)/8 = 26.25.

indicate an average cost of equity capital for HECO of 10.62 percent, not the 11.0 percent he reports [10.62% = 11.0% - 0.38%].

Q. IN ADDITION TO THE ISSUES YOU HAVE DESCRIBED, ARE THERE PROBLEMS WITH DR. MORIN'S SAMPLE GROUP OF ELECTRIC UTILITY COMPANIES?

A. Yes. In estimating the cost of equity for HECO, both Dr. Morin and I have used similar risk sample groups of publicly traded electric utilities because 1) HECO does not have publicly-traded common equity and 2) the use of a sample group of several companies offers a more statistically reliable estimate of the cost of equity capital. Dr. Morin has used two electric utility sample groups. While that fact alone is not problematic, there are other aspects of his sample group selection process that indicate Dr. Morin's reliance on the second group—Moody's electric utility sample group—does not provide a reliable estimate of the cost of equity capital of HECO.

First, rather than tailoring his screening criteria to the subject utility to select a group of companies of similar risk, Dr. Morin elects to utilize a larger sample group of companies which, by definition, are less similar in risk with the belief that the resulting estimation errors will be evenly distributed and cancel out. (HECO T-19, p. 43) Dr. Morin undertakes this methodology due to his belief that the electric utility industry is "highly fluid and unstable." While few would argue that there have been some changes in the electric utility industry over the years, in my view, those changes fall far short of creating the disarray on which Dr. Morin appears to base his sample selection rationale. Simply put, analyzing a larger sample group of dissimilar-risk firms is unlikely to provide a better estimate of the cost of equity capital than a smaller sample group of firms that are selected to be similar in risk to the target company—in this instance, HECO.

Second, in selecting his primary sample group for the purpose of determining the cost of equity of HECO, Dr. Morin selected a group from companies that had integrated electric operations. He also applied some additional screening criteria, eliminating companies with below investment-grade bond ratings, foreign companies, companies that do

not pay dividends, those with market capitalization below $0.5 Billion, and those that were not followed by Value Line. However, in selecting his sample primary sample group to estimate the equity cost for a company that earns 100% of its regulated revenue from electric utility operations, Dr. Morin selects firms that have as much as 50% of revenues from other types of operations. As noted above, that sample selection process is designed to create a larger group of companies, not one that is closely aligned with the investment risks of HECO.

Third, Dr. Morin elects to analyze the equity capital cost of another group of utilities (what he terms the Moody's electric utility group) that are, in the main, not similar in risk to HECO. First, eleven of the companies included in Dr. Morin's second (Moody's) sample group were specifically excluded from consideration in constructing his primary electric utility sample. Therefore those firms did not even pass Dr. Morin's broad screening criteria. For example, Constellation Energy and NiSource Inc., both included in Dr. Morin's second (Moody's) group of companies, had 13 percent and 16 percent of revenues from electric operations, respectively, according to AUS Utility Reports (March 2009). Dr. Morin excluded those companies from his primary sample group because they had characteristics that made them dissimilar in risk to HECO. It is unreasonable, therefore, to re-include those companies in an additional sample group used to estimate the Company's cost of equity.

Also, the nine companies remaining in Dr. Morin's Moody's electric sample group are included in his primary integrated electric group and the analysis of their cost of equity is redundant. There is no need to apply the cost of equity methods to those companies twice.

Finally regarding Dr. Morin's second sample group, Moody's ceased publication of its electric utility index in 2002. Therefore, the "Moody's group" is not based on any current publication and it is reasonable to believe that Dr. Morin's second sample group of electric utilities is not representative of investors' current expectations with regard to the

utility industry.[21] In referring to Dr. Morin's similar-risk sample group, therefore, I will refer only to his integrated electric utility group and not to his "Moody's electric" sample group, which would not provide a reliable indication of the cost of equity of HECO.

B. DR. MORIN'S CAPITAL ASSET PRICING MODEL

Q. WHAT ARE YOUR COMMENTS ON DR. MORIN'S CAPM ANALYSIS?

A. There are three factors in any CAPM cost of equity estimate: the risk-free rate, the market risk premium and the beta coefficient. According to CAPM theory, the cost of equity equals the risk-free rate plus beta times the market risk premium. Each of those elements in Dr. Morin's CAPM analysis serves to overstate the cost of equity capital.

With regard to the risk-free rate, Dr. Morin uses a 4.6 percent long-term Treasury bond yield as the risk-free rate. Interest rates have fallen since he performed his cost of equity analysis. As noted in my CAPM analysis, long-term T-Bonds are yielding about 3.5 percent. Therefore, Dr. Morin's CAPM estimate is 110 basis points too high due to the decline in interest rates, which is not captured in his analysis. That change in risk-free rate, alone, would reduce Dr. Morin's CAPM from 10.6 percent (prior to the addition of flotation costs) to 9.6 percent.

Q. WHAT ARE YOUR COMMENTS REGARDING THE BETA COEFFICIENT IN DR. MORIN'S STANDARD CAPM ANALYSIS?

A. Dr. Morin's integrated electric utility sample group has a current average beta coefficient of 0.69, according to Value Line.[22] In his analysis in this proceeding, Dr. Morin used a Value

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[21] Interestingly, even though Moody's ceased publication of its utility index years ago, the companies included in that list by Dr. Morin have recently changed. In his testimony on behalf of Puget Energy earlier this year (Washington Utility & Transportation Commission. Docket No. UE-072300/UG-072301, Morin Direct, Exhibit__(RAM-17), p. 1), he used a "Moody's Electric Utilities" sample that did not include CH Energy Group. However, Dr. Morin includes that company in his Moody's Electric Utilities sample group in his testimony in this proceeding.

[22] The Value Line Investment Survey, Summary & Index, March 6, 2009. By definition the beta of "the market" is 1.0, and the beta of a firm with higher-than-average risk will be above one. For companies like utilities that have lower-than-average investment risk, their betas are usually below 1.0.

Line beta of 0.82. Using a more current 0.69 beta, rather than the 0.82 beta used by Dr. Morin, along with the 7.4 percent market risk premium used in his analysis, would cause an additional reduction of 96 basis points in Dr. Morin's CAPM results [0.82 – 0.69 = 0.13 x 7.4% = 0.96%].

As shown on page 28 of HECO T-19, Dr. Morin's original CAPM cost of equity estimate is 10.7 percent (without flotation costs). Substituting the current risk-free rate and the current Value Line beta for his similar-risk sample group indicates a CAPM result that is more than 200 basis point lower—8.61 percent [3.50% (current risk-free rate) + 0.69 (current beta) x 7.4% (Morin's selected market risk premium) = 8.61%].

Q. WHAT ARE YOUR COMMENTS REGARDING DR. MORIN'S CALCULATION OF THE MARKET RISK PREMIUM IN HIS CAPM ANALYSIS?

A. Dr. Morin averages a long-term historical market premium provided by Ibbotson Associates (now Morningstar) and a forward-looking market premium calculated by applying a DCF analysis to a group of stocks followed by Value Line. Dr. Morin's analysis produces a market risk premium estimate of 7.4%. As I have noted previously, a current finance textbook cited by Dr. Morin in his own text (Brealey & Meyers), indicates, based on the latest empirical research, a reasonable range for the market risk premium is 3.8% to 6.8%. Dr. Morin's estimate of the market risk premium is beyond the upper end of that range and can be said, therefore, to be overstated.

Even without regard to the estimated value of the market risk premium, Dr. Morin's CAPM estimate would currently be 8.61%, based on the current risk-free rate and current Value Line betas. Adjusting Dr. Morin's market risk premium estimate to conform with lower current expectations published in finance textbooks would further reduce that result.

Q. DOESN'T DR. MORIN POINT TO A 2003 PAPER BY HARRIS, MARSTON, MISHRA AND O'BRIEN TO SUPPORT HIS 7.4 PERCENT MARKET RISK PREMIUM ESTIMATE?

A. Yes, he does. However, one of the authors of that article, like many in the academic community, now has a different opinion regarding a reasonable forward-looking market risk premium.

Q. CAN YOU PLEASE EXPLAIN THAT STATEMENT?

A. Yes. Dr. Morin, Professor Felicia Marston (one of the authors of the market risk premium study referenced by Dr. Morin) and I made presentations at the 39th Annual Financial Forum of the Society of Utility and Regulatory Financial Analysts in April of 2007 in Washington, DC. Dr. Morin made his presentation on the first day of the conference, while Professor Marston and I were on a panel during the second day of the conference, where the topic of the discussion was the market risk premium.

In her presentation, Professor Marston discussed the mechanics of her ex-ante market risk premium studies (she did a study in 2001 as well as the 2003 paper cited by Dr. Morin). She noted that the 2003 study finds a 7.1 percent market risk premium and a 4.15 percent risk premium for utilities. She also noted that the 7.1 percent market risk premium should be considered an upper bound due to the data anomalies contained in the study and concluded that a reasonable estimate of the current market risk premium is 5 percent to 6 percent. The final slide in Professor Marston's power-point presentation from the April 2007 financial conference is shown below:

Table IV
Marston Presentation Slide
2007 Annual Financial Forum
Society of Utility and Regulatory Financial Analysts

- I view 7.1% as a comparison to historical-based estimates and as an upper bound
- Given this, and historical evidence, my opinion currently of market risk premium is 5%-6 %. Using Stephen's .85 beta estimate→

(1) E(R) utilities = 5% + .85 (6%)=10.1%

(2) E(R) utilities = 5% + .85 (5%) = 9.25 %

- Ex ante risk premium on ***utilities*** (using dividend growth model) was estimated at 4.15 %→

E(R) utilities = 5% (rf) + 4.15 % = 9.15%

As the slide displayed in Table IV shows, when Professor Marston's current risk premium is used, the cost of equity for the general market (shown as E(R) here), ranges from 9.25 percent to 10.1 percent. When Professor Marston's risk premium for utilities (4.15%) is used, the estimated utility cost of equity is 9.15 percent. Moreover, those estimates are based on risk-free rates of 5%, which are higher than the current risk-free rate of 4.35%. In sum, Professor Marston's current opinions do not support Dr. Morin's choice of market risk premium or CAPM cost of equity estimates. [Note: Professor Marston's entire presentation is available on the Society of Utility and Regulatory Financial Analysts' website: http://www.surfa.com/ppres.php; the document is entitled "Revisiting the Equity Risk Premium-Marston.pdf."]

Q. WHAT ARE YOUR COMMENTS ON DR. MORIN'S USE OF THE EMPIRICAL CAPM—THE ECAPM?

A. As Dr. Morin notes at page 29 of HECO T-19, the "empirical" CAPM (ECAPM) is designed to account for the fact that the Capital Market Line is believed to have a lower slope than postulated theoretically. A lower slope for the Capital Market Line implies that the CAPM understates the equity cost rate for low beta stocks like utilities and over-estimates the equity cost rate for high beta stocks like "dot-com" companies. The flaw in Dr. Morin's "empirical" CAPM analysis is that he uses "adjusted" betas in his ECAPM analysis while the research on which the "low slope" theory is based on betas that are not adjusted.

Beta estimates published by Value Line are adjusted for the theoretical tendency for beta coefficients to migrate toward the market average of 1.0. "Adjusted" betas are higher for low-beta stocks like utilities and lower for high-beta stocks like "dot-com" companies. In other words, when low betas are adjusted upward and high betas are adjusted downward, that has the same effect as lowering the slope of the Capital Market Line. Using "adjusted" betas along with an ECAPM analysis double-counts the effect of changing the slope of the Capital Market Line. All of the theoretical research Dr. Morin cites regarding the support for the ECAPM (except his own) is based on studies using "raw" or "unadjusted" betas.

Q. DOESN'T DR. MORIN INDICATE THAT THE ECAPM "SLOPE" ADJUSTMENT IS DIFFERENT FROM THE VALUE LINE BETA ADJUSTMENT, AND DOES NOT CONFLICT?

A. That is his position. It is correct that the ECAPM "slope" adjustment and the Value Line beta adjustment originate from different theoretical concepts; however, they have the same effect. Raising low betas and lowering high betas (the result of Value Line's "adjustment"), works to lower the slope of the Capital Market Line, which is also the result of the ECAPM. Therefore, Dr. Morin is incorrect to assume that using adjusted betas in an ECAPM calculation does not double-count the slope-lowering effect. Using adjusted betas in an ECAPM calculation results in an overstated cost of equity estimate.

However, in the current market environment, Dr. Morin's ECAPM overstatement due to his use of adjusted betas is a moot point. That is because, even assuming that adjusted betas were acceptable in an ECAPM analysis *and* the expected market risk premium is 7.4%, the use of a current risk-free rate and the current Value Line average beta for Dr. Morin's integrated electric group would produce an ECAPM estimate of 9.18%, according to Dr. Morin's formula on page 31 of HECO T-19 [3.5% + 0.25 x 7.4% + 0.75 x 0.69 x 7.4% = 9.18%]. In sum, an updated application of Dr. Morin's ECAPM (even without correcting for adjusted betas or the expected market risk premium) supports the reasonableness of my 9.5% equity cost estimate in this proceeding.

C. DR. MORIN'S RISK PREMIUM ANALYSES

Q. PLEASE DESCRIBE THE RISK PREMIUM ANALYSES UNDERTAKEN BY DR. MORIN IN HIS DIRECT TESTIMONY IN THIS PROCEEDING.

A. Dr. Morin has performed two separate risk premium analyses based on historical data. The risk premium analyses Dr. Morin utilizes include an examination of the historical return difference between earned returns of electric companies and the yield on long-term treasury bonds. Company witness Morin performs this analysis over a period beginning in 1931 through 2006 for electric utilities. In the final risk premium analysis, Dr. Morin compares the allowed returns for electric utilities with contemporaneous long-term U.S. Treasury Bond (T-Bond) yields from 1998 through 2007.

Dr. Morin estimates an investor-expected risk premium between long-term Treasury bonds and electric utility stocks of 5.7% using the long-term historical data and 5.6% using historical allowed returns. To those risk premiums, he added a then-current Treasury bond yield of 4.6% to obtain equity cost estimates of 10.2% and 10.3% (prior to the application of a flotation cost adder). Using the current T-Bond yield of 3.5%, Dr. Morin's risk premium analyses would produce equity cost estimates of 9.1% and 9.2%.

Q. DO YOU HAVE ANY COMMENTS OF A GENERAL NATURE REGARDING RISK PREMIUM-TYPE ANALYSES?

A. No. While I believe that the results of the type of historical risk premium analyses employed by Dr. Morin are variable, dependent on the time period selected for analysis and likely to overstate the cost of equity capital, a detailed discussion of those flaws in this instance is moot because, even under the method employed by Dr. Morin, the current result of those analyses is below my recommended cost of equity in this proceeding.

D. DR. MORIN'S DISCOUNTED CASH FLOW ANALYSIS

Q. WHAT ARE YOUR COMMENTS REGARDING DR. MORIN'S DCF ANALYSIS?

A. Dr. Morin's standard DCF analysis relies on dividend yields published in Value Line. I have no concerns with the use of that source of information. As I have noted previously, Dr. Morin increases the current dividend by one plus the DCF growth rate, which tends to overstate the dividend yield if applied to all companies in the sample group. Also, as Value Line explains to its subscribers in, "*A Subscribers' Guide*," the dividend yield published by Value Line in its *Ratings and Reports*, is based on the "cash dividends *estimated to be declared in the next 12 months* divided by the recent [stock] price." Therefore, in adjusting the dividend yield published by Value Line for one year's expected growth, Dr. Morin is double counting that growth. His dividend yields are overstated for that reason.

The growth rate portion of Dr. Morin's DCF analysis is also problematic. First, Dr. Morin's growth rate analysis is mechanistic in that it simply plugs selected projected data into a formula to produce a growth rate with no underlying analysis of either the historical or projected growth rate fundamentals. Dr. Morin, in his own published work, warns against this type of analysis.[23]

Second, Dr. Morin's growth rate analysis relies exclusively on earnings growth rate projections. As I discussed in detail in Appendix B attached to my Direct Testimony,

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[23] Morin, R., Regulatory Finance, Utilities' Cost of Capital, Public Utilities Reports, Arlington, VA, 1994, p. 244.

exclusive reliance on earnings growth, absent any examination of the underlying fundamentals of long-run growth, can lead to inaccurate equity cost estimates. For example, reliance on projected earnings growth in a situation in which projected earnings were expected to recover from reduced levels would include (in any DCF estimate) the assumption that equity returns will increase at the same exaggerated rate every five years into the indefinite future. Of course, this would not be a reasonable expectation, and any DCF analysis based on a mechanistic analysis that automatically includes such data would not produce a reasonable result. Therefore, while I have no problem with the consideration of earnings growth rate projections in determining DCF growth, they should not be afforded the exclusive weighting allowed by Dr. Morin, especially absent consideration of the underlying factors.

Third, as I have explained previously, analysts' earnings growth estimates have shown, through empirical analysis, to be overly-optimistic (i.e., too high), in comparison to actual growth rate results. Therefore, any DCF result obtained using those growth rates should be considered an upper bound of the cost of equity.

Fourth, the projected earnings growth rates used by Dr. Morin overstate reasonable long-term earnings growth. HECO-1905 shows that Dr. Morin's DCF estimate for his integrated electric companies is based on an average long-term growth rate of 7.2%. As shown in DOD-205, the actual average growth rate for earnings per share in the electric industry was about 3.5% over a fifty-year period ending in 1999—well below the concurrent growth in GDP, which was 6.9%. Those facts, coupled with the fact that the current long-term expectation for GDP growth is less than 4.5% (considerably lower than historical growth rates for the economy), indicates that 7.2% is simply not a reasonable estimate for the long-term growth called for in a DCF equity cost estimate. If electric utilities have grown steadily at a rate below that of the general economy historically and the economic growth rate is expected to decline below historical levels it is not reasonable to believe that electric utility growth over the long term will substantially increase, doubling its long-term historical rate and out-stripping the growth rate in the economy. Again, Dr.

Morin's sole reliance on projected earnings growth is unwarranted and results in DCF equity cost estimates that are overstated.

Q. HAS DR. MORIN TESTIFIED RECENTLY THAT THE DCF UNDERSTATES THE COST OF EQUITY WHEN MARKET PRICES ARE ABOVE BOOK VALUE AND OVERSTATES THE COST OF EQUITY WHEN MARKET PRICES ARE BELOW BOOK VALUE?

A. Yes. While he has not provided that opinion in Direct Testimony in this proceeding, he testified to that effect in his rebuttal testimony in Puget Energy's recent 2008 rate case[24] and also in rebuttal testimony before this Commission in 2007.[25]

Q. HAS HIS POSITION ON THIS ISSUE BEEN CONSISTENT?

A. No, Dr. Morin's first text on the cost of capital, Utilities' Cost of Capital, was published in 1984, and was conceived and written during a time period for utilities in which interest rates were very high and market prices were generally below book value. As shown in the chart below, the market price of Moody's Electric Utilities was below 1.0 for the ten-year period from 1974 through 1984 and averaged only 0.75 of book value during that time.

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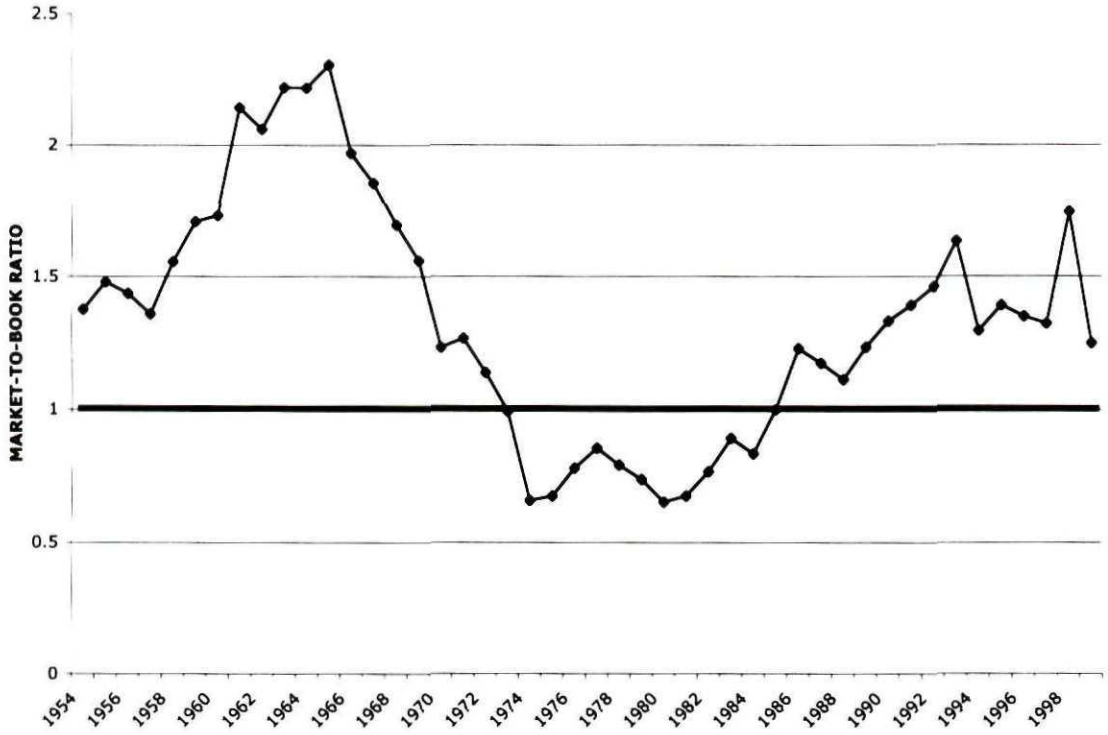
[24] *Washington Utility & Transportation Commission v. Puget Sound Energy*, Docket No, UE-072300/UG-072301, Morin Rebuttal, pp. 9, 10.

[25] Hawaiian Electric Company, H.P.U.C. Docket No. 2006-0386.

Chart III

Market-to-Book Ratio

Moody's Electric Utilities



All data from Mergent 2001 Public Utility Manual.

There is no indication in Dr. Morin's 1984 text that when market prices are below book value (as they were at that time), the DCF overstates the cost of equity (as Dr. Morin now claims).[26] Not only does Dr. Morin's original text not support his current position that a market price below book value indicates that the DCF overstates the cost of equity, it actually adopts an opposing view. At page 98 of his 1984 text, Dr. Morin states that the application of the standard DCF model to a public utility whose market-to-book ratio was

[26] The logic on which Dr. Morin bases his claim that the DCF understates the cost of equity when market prices exceed book value also indicates that the DCF overstates the cost of equity when market prices are less than book value.

below one would result in a "downward-biased estimate of the cost of equity," i.e., the DCF would understate the cost of equity.

In 1984, when utility stock prices had been below book value for a decade, Dr. Morin is on record stating that the DCF understates the cost of capital when market prices are below book value. Now that utility stock prices are generally above book value, Dr. Morin is on record stating that the DCF understates the cost of capital because market prices are above book value. Dr. Morin's published opinions regarding the accuracy of the DCF relative to current market-to-book values is inconsistent and that inconsistency, in my view, undermines the reliability of Dr. Morin's position on this subject.

Q. WHAT EXAMPLE DOES DR. MORIN USE TO SUPPORT HIS CURRENT POSITION REGARDING THE RELIABILITY OF DCF ESTIMATES?

A. Dr. Morin, in his Rebuttal Testimony in Puget Sound Energy's most recent rate case (Docket Nos. UE-072300/UG-072301), and at pages 434 and 435 of his text, New Regulatory Finance (Public Utilities Reports, Vienna, VA, 2006), sets out the following numerical example:

Table V

Dr. Morin's Market-to-Book Example

	Situation 1	Situation 2	Situation 3
1 Initial Purchase Price	$25.00	$50.00	$100.00
2 Initial Book Value	$50.00	$50.00	$50.00
3 Initial M/B	0.50	1.00	2.00
4 DCF Return 10% = 5% + 5%	10.00%	10.00%	10.00%
5 Dollar Return	$5.00	$5.00	$5.00
6 Dollar Dividends 5% Yield	$1.25	$2.50	$5.00
7 Dollar Growth 5% Growth	$3.75	$2.50	$0.00
8 Market Return	20.00%	10.00%	5.00%

Dr. Morin's explanation of the "impact" of market-to-book ratios on the DCF cost of equity in "Situation 3" (when market prices are above book value) proceeds as follows:

> [t]he DCF cost rate of 10%, made up of a 5% dividend yield and a 5% growth rate, is applied to the book value rate base of $50 to produce $5.00 of earnings. Of the $5.00 of earnings, the full $5.00 are required for dividends to produce a dividend yield of 5% on a stock price of $100.00, and no dollars are available for growth. The investor's return is therefore only 5% versus his required return of 10%. A DCF cost rate of 10%, which implies $10.00 of earnings, translates to only $5.00 of earnings on book value, or a 5% return.[27]

Dr. Morin elects not to discuss "Situation 1" in which market prices are below book value and the DCF, supposedly, overstates the cost of equity. Of course, as I noted previously, during the time period when market prices were actually below book value, Dr. Morin expressed no concerns that the DCF overstated the cost of equity due to differences in market price and book value—he expressed the opposite view.

Q. DOES DR. MORIN'S NUMERICAL EXAMPLE, SET OUT ABOVE, SUPPORT HIS THESIS THAT THE DCF IS INACCURATE WHEN MARKET PRICES ARE DIFFERENT FROM BOOK VALUE?

A. No. In attempting to show that the DCF estimates the cost of equity incorrectly when market prices are different from book value, Dr. Morin has created a hypothetical situation that cannot exist in reality and is contrary to one of the most fundamental precepts in finance.

In attempting to show that the DCF understates the cost of capital when market prices are above book value, Dr. Morin's "Situation 3" example posits a firm that has an allowed return of 10 percent (which is assumed to be determined by the DCF), a book value of $50, and for which investors are paying a stock price equal to twice book value ($100). That company will earn $5 on its rate base investment (10 percent allowed return x $50 rate base/book value), and that $5 return represents only a 5 percent return to the investors that paid $100 for the stock. Dr. Morin, through this example, ostensibly concludes that the

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[27] Morin, R., New Regulatory Finance, Public Utilities Reports, Vienna, VA, (2006), p. 435.

DCF does not provide the investors' required 10 percent return (the investor-required return assumed to be provided by the DCF) when it is applied to a rate base (book value) that is smaller than the market price. This is a spurious conclusion for two reasons.

First, if the investor's required return is actually 10 percent (which appears to be Dr. Morin's assumption) and the utility is expected to earn a 10 percent return on its book value of $50, or $5, then no investor would pay twice book value for that stock. Therefore, the situation on which Dr. Morin's DCF unreliability rationale is grounded cannot exist. Imagine a stockbroker trying to sell a stock to an investor who requires a 10 percent return. "I've got a stock for you that's going to pay you $5 annually, but each share will cost you $100. What do you say?" No investor would knowingly pay $100 for a stock that will earn $5 when he or she requires a 10% return for that type of stock, a fact which Dr. Morin himself confirms:

> "Investors will not provide equity capital at the current market price if the earnable return on equity is below the level they require..."[28]

Yet, that is the logical construct on which Dr. Morin's "Situation 3" example rests. Second, the only reason for an investor to pay $100 for a stock that will provide a $5 income stream is if that investor requires a 5 percent return for that type of stock. In Dr. Morin's "Situation 3" example if we take the 10 percent number to be the allowed return (the expected return on the $50 rate base), and the investor's cost of capital to be 5 percent (a DCF result derived from a 5 percent dividend yield and 0 percent growth), then his numerical example makes economic sense. If the investor's required return is 5 percent and the stock in question is expected to pay a 10 percent return on a $50 book value, then, *and only then*, is the $100 stock price rational.

Therefore, the only situation under which the numerical conditions set out in Dr. Morin's example can exist is one that conforms to the widely accepted relationship

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[28] HECO T-19, p. 5, ll. 8-10.

between market price, book value, ROE and the cost of capital.[29] Namely, when the expected return (r = 10% in "Situation 3," above) exceeds the investors' required return (K = 5% in "Situation 3," above) the market price (P = $100) will exceed the book value (B = $50).

In summary, Dr. Morin's numerical example, which purports to show that the DCF understates the cost of equity when market prices are different from book value, does not accomplish that goal. Instead, under the only circumstance that is economically plausible, his example shows that when utility market prices are significantly above book value, the investors' required return (the cost of equity capital) is below the ROE expected to be earned by those companies.

Q. DID THE ORIGINATOR OF THE DCF, PROFESSOR MYRON GORDON, INDICATE THAT THE DCF WOULD PROVIDE EQUITY COST ESTIMATES THAT WERE SKEWED DOWNWARD (UPWARD) IF THE MARKET PRICE WAS ABOVE (BELOW) BOOK VALUE?

A. No, he did not. Professor Gordon was certainly aware that utility market prices could differ from book value. However, there is no discussion in his text regarding differences between market price and book value having any impact on the ability of the DCF to estimate investors' expected return on common equity (the cost of equity capital). Professor Gordon does note, however, that if market prices are well above book value, that situation indicates that the expected accounting return (the return on book value) exceeds the cost of common equity.

The integrated electric utilities used by Dr. Morin as a similar-risk proxy for HECO have an expected return on book equity of 10.6 percent during the 2009 period, according to Value Line's most recent editions of *Ratings and Reports*. AUS Utility Reports indicates that those same companies have a current average market-to-book ratio of 1.56. While

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[29] Gordon, M.J., The Cost of Capital to a Public Utility, MSU Public Utilities Studies, East Lansing, Michigan, (1974), pp., 63-64; Kolbe, Read, Hall, The Cost of Capital: Estimating the Rate of Return for Public Utilities, 25-33 (1986); Lawrence Booth, ("The Importance of Market-to-Book Ratios in Regulation," NRRI Quarterly Bulletin, Vol. 18, No. 4, at 415-16 (Winter 1997).

those relationships do not pinpoint the cost of capital, according to the originator of the DCF, they indicate that a current cost of equity capital is well below 10.6 percent and the 11.15 percent equity cost estimate provided in this proceeding by Dr. Morin is not a plausible estimate of HECO's cost of equity capital.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY, MR. HILL?

A. Yes, it does.

EDUCATION AND EMPLOYMENT HISTORY OF STEPHEN G. HILL

EDUCATION

Auburn University - Auburn, Alabama - Bachelor of Science in Chemical Engineering (1971); Honors - member Tau Beta Pi national engineering honorary society, Dean's list, candidate for outstanding engineering graduate; Organizations - Engineering Council, American Institute of Chemical Engineers

Tulane University - New Orleans, Louisiana - Masters in Business Administration (1973); concentration: Finance; awarded scholarship; Organizations - member MBA curriculum committee, Vice-President of student body, academic affairs

Continuing Education - NARUC Regulatory Studies Program at Michigan State University

EMPLOYMENT

West Virginia Air Pollution Control Commission (1975)
Position: Engineer ; Responsibility: Overseeing the compliance of all chemical companies in the State with the pollution guidelines set forth in the Clean Air Act.

West Virginia Public Service Commission-Consumer Advocate (1982)
Position: Rate of Return Analyst ; Responsibility: All rate of return research and testimony promulgated by the Consumer Advocate; also, testimony on engineering issues, when necessary.

Hill Associates (1989)
Position: Principal; Responsibility: Expert testimony regarding financial and economic issue in regulated industries.

PUBLICATIONS

"The Market Risk Premium and the Proper Interpretation of Historical Data," Proceedings of the Fourth NARUC Biennial Regulatory Information Conference, Volume I, pp. 245-255.
"Use of the Discounted Cash Flow Has Not Been Invalidated," Public Utilities Fortnightly, March 31, 1988, pp. 35-38.
"Private Equity Buyouts of Public Utilities: Preparation for Regulators," National Regulatory Research Institute, Paper 07-11, December 2007.

MEMBERSHIPS

American Institute of Chemical Engineers; Society of Utility and Regulatory Financial Analysts (Certified Rate of Return Analyst, Member of the Board of Directors)

PRIOR EXPERIENCE

Mr. Hill, is a Certified Rate of Return Analyst, doing business as Hill Associates. He has testified in more than 250 regulatory proceedings over the past twenty five years on cost of capital, financial, economic, and corporate governance issues related to regulated industries. He has provided testimony in electric, gas, telephone, and water utility rate proceedings as well as in proceedings related to utility diversification, deregulation, and management financial policy. In those cases, he has testified on behalf of consumer advocates, attorneys general and utility commissions. In addition, he has testified on cost of capital issues in auto, homeowners and workers' compensation insurance rate proceedings. Mr. Hill has also been an advisor to the Arizona Corporation Commission on matters of utility finance in bankruptcy proceedings.

Mr. Hill has testified before the West Virginia Public Service Commission, the Texas Public Utilities Commission, the Oklahoma State Corporation Commission, the Public Utilities Commission of the State of California, the Maryland Public Service Commission, the Pennsylvania Public Utilities Commission, the State of Maine Public Utilities Commission, the Ohio Public Utilities Commission, the Missouri Public Service Commission, the City Council of Austin, Texas, the South Carolina Public Service Commission, the Public Utilities Commission of the State of Hawaii, the New Mexico Corporation Commission, the Minnesota Public Utilities Commission, the State of Washington Utilities and Transportation Commission, the State of Rhode Island Public Utilities Commission, the New Hampshire Public Service Commission, the Public Service Commission of Utah, the Illinois Commerce Commission, the Kansas Corporation Commission, the Vermont Public Service Board, the Indiana Utility Regulatory Commission, the Virginia Corporation Commission, the Montana Public Service Commission, the Arizona Corporation Commission, the Public Service Commission of the State of Wisconsin, the Insurance Commissioner of the State of Texas, the North Carolina Insurance Commissioner, the Georgia Public Service Commission, the Connecticut Department of Public Utility Control, the Public Service Commission of Louisiana, the Kentucky Public Utilities Commission, the Federal Communications Commission and the Federal Energy Regulatory Commission.

THE IMPACT OF DECOUPLING ON ELECTRIC UTILITY OPERATING RISK

STEPHEN G. HILL

NARUC FOURTH NATIONAL CONFERENCE ON
INTEGRATED RESOURCE PLANNING

BURLINGTON, VERMONT

SEPTEMBER 14, 1992

The Impact of Decoupling
On
Electric Utility Operating Risk

Stephen G. Hill

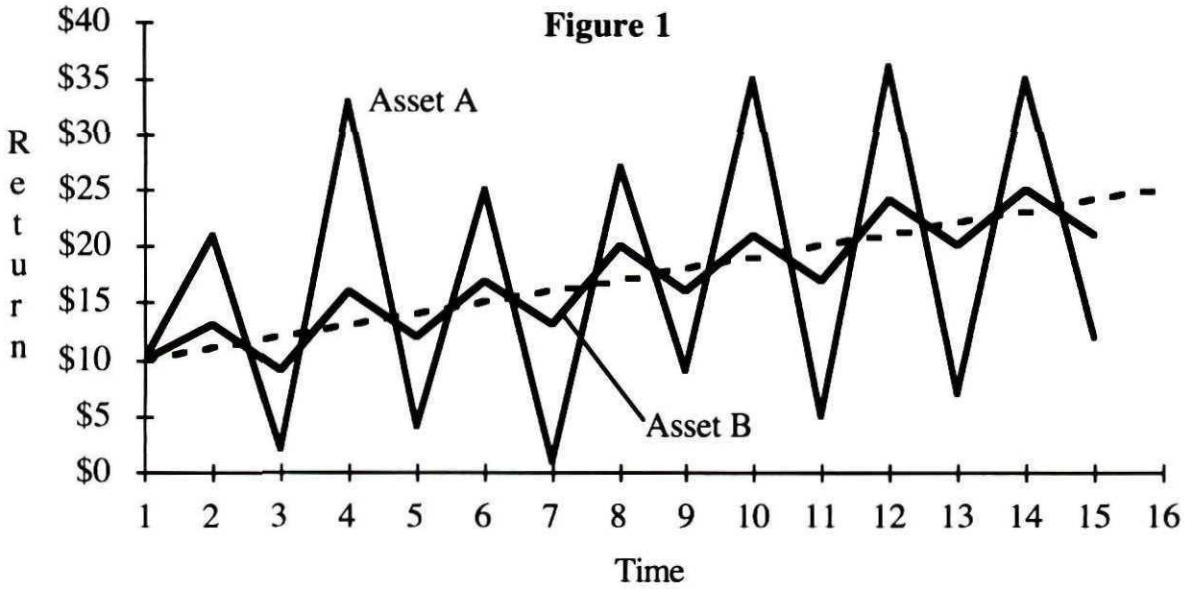
Because decoupling utility revenues from sales has the effect of reducing the utility's exposure to revenue stream volatility caused by weather and economic conditions, it lowers the operating risk of the utility. Lower operational risk for the utility equals lower risk for investors, which calls for lower allowed rates of return on equity. This paper offers an analytical framework through which that risk reduction imparted by decoupling can be assessed and the equity capital cost impact quantified.

VOLATILITY AND RISK

A financial asset is purchased by an investor with an expectation that the asset will produce a future stream of income, generating an expected rate of return. The risk of investing in any asset is directly related to the possibility that actual returns will deviate from expected returns, and the degree of those potential fluctuations determines the degree of risk. The greater the potential for actual returns to deviate from expected returns, the higher the risk. Conversely, the more certain an investor can be that the returns expected will be realized, the lower the risk.

A measure of the risk of a financial asset, then, is the volatility or variability of the income stream or return it generates. Figure 1, below, shows the income streams generated by two financial assets, "A" and "B." Both of the assets have, over time, provided a trend of increasing returns. In fact, the trend line of the returns (shown as the dashed line in Fig. 1) for both investments is the same. Therefore, given that conditions in the future can be expected to resemble those of the past, investors would, on average, expect that the income produced by each investment to be the same in future periods.

Figure 1



However, the risk of investing in the two financial assets is not the same. Asset "A" has shown much wider swings in return, much greater volatility, than has asset "B." Therefore, even though, asset "A" has the same expected future income stream as asset "B," there is a much lower probability that the actual return realized from an investment in asset "A" will equal the expected return. Asset "A," then, is a riskier investment than asset "B" whose actual return will, in all probability, more closely approximate the expected return.

When an investor purchases a share of utility stock he or she is purchasing an expected future stream of income in the form of dividends and growth in that dividend or capital appreciation when the stock is sold. That dividend expectation is, in turn, dependent on the earnings of the utility. If the earnings are steady and show little fluctuation, the dividend is more secure and the utility is seen by the investor as less risky than an otherwise similar investment whose dividend is based on a volatile earnings stream. The fact that the income stream volatility of a financial asset is directly related to its investment risk is neither controversial nor difficult to comprehend, but that concept is fundamental to assessing the risk impact of decoupling. Decoupling works to reduce the income stream volatility of utility operations and, thus, operating risk.

DECOUPLING AND VOLATILITY

Decoupling is intended to promote energy conservation by separating utility revenues from aggregate unit sales and targeting, instead, some measure of customer consumption. A target of per customer consumption is set and, ideally, if conservation occurs, the resulting per customer consumption will be below the target level. The utility is allowed to raise its rates to recover enough revenues to raise the realized revenue level to the target level of revenues per customer. If, on the other hand, conservation does not occur, and per customer consumption exceeds target levels, the utility is required to return to its ratepayers those revenues which exceed that target level.

However, in a decoupling regulatory regime, there is no mechanism for discerning the source of the change in energy use per customer. The reduction in usage may come from conservation, or it may come from lower customer usage due to other factors completely unrelated to conservation, i.e., warmer winters or a downturn in the regional economy of a utility heavily dependent on commercial and/or industrial sales. Because there is no practical way to distinguish the various factors which may affect per customer usage, all factors which impact per customer usage are necessarily included in the decoupling, make-whole process. Therefore, the decoupling process acts as a buffer for the utility, sheltering its stockholders from fluctuations in revenues and, ultimately, moderating swings operating earnings which might arise from unfavorable weather or economic conditions.

As regulators are well aware, those two factors -- weather and the economic condition of the utility's service territory -- are often important determinants of the revenue requirements of an electric utility operation. If, through a decoupling process, the utility is made whole for revenue under-recoveries due to unseasonable weather or economic downturns, the potential for revenue and income volatility is greatly reduced. Investors and investor advisory services are quite aware of the fact that a reduction in the income stream volatility reduces the overall investment risk of a utility operation. Subsequent to one Northeastern public service commission's approval of a trial decoupling experiment with an electric utility operating in its jurisdiction in 1991, the Value Line Investment Survey was quick to point out to its subscribers that the new regulatory plan would reduce that utility's exposure to fluctuations in revenues due to weather and economic conditions. Therefore, removal of the income volatility and risk associated with those factors indicates that a utility's "pre-decoupling" allowed return on equity should be reduced.
Decoupling lowers a utility's operating risk and, unless that lower operating risk is recognized in rates through the allowance of a lower authorized rate of return, decoupling will produce a windfall for the utilities which operate under

that regime. Instituting a decoupling program for utilities without a downward adjustment to the allowed equity return, then, would create utility rates which exceed costs and encourage inefficient allocation of utility resources. Therefore, the allowed return on equity for a utility that is entering a regulatory framework in which revenues are decoupled from sales must be lower than that appropriate for the same utility under "traditional" regulation -- but how much lower?

An analytical process through which the impact of decoupling on allowed returns can be estimated is presented below, however, it is intuitively obvious that the more dependent the utility's revenues are on weather and economic fluctuations, the greater the risk reduction caused by decoupling and the lower the allowed equity return should be. If, for example, 100% of the revenue variations of a utility were due to weather and economic conditions, the implementation of decoupling would eliminate volatility in the utility's revenue stream and effectively turn a utility equity investment into a bond-like financial instrument. In that extreme instance, the level of uncertainty regarding the expected return which normally accompanies a utility equity investment would be substantially reduced by decoupling and an appropriate equity return would fall toward that appropriate for utility debt capital.

RISK QUANTIFICATION

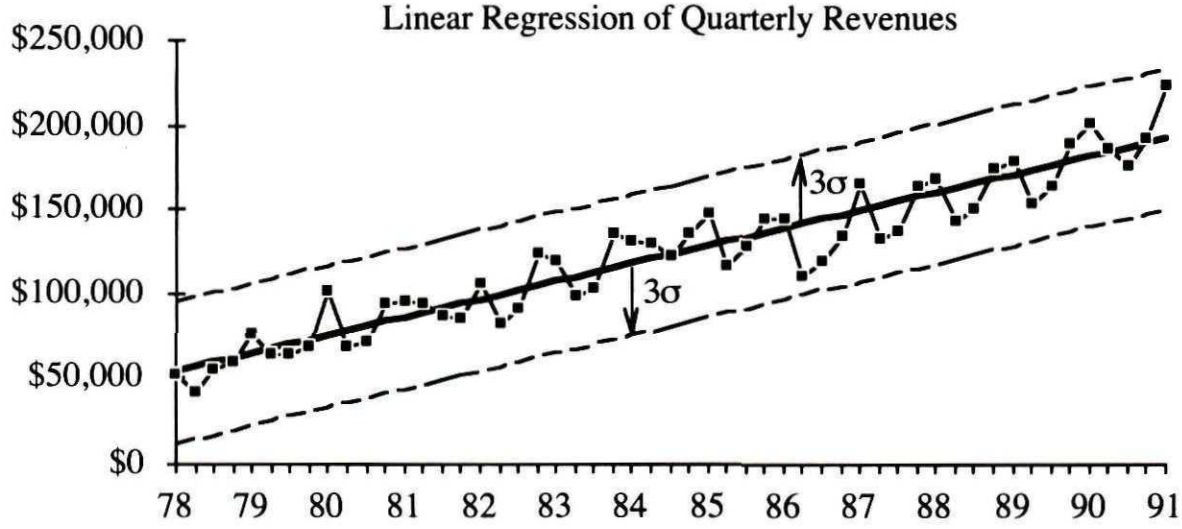
Quantifying the change in operating risk of a utility operation due to a reduction in revenue volatility caused by a decoupling is a two step process. First, the degree to which fluctuations in utility revenues are dependent on weather and economic conditions must be measured and, second, the revenue volatility that normally exists with the utility operation must be quantified.

Measuring the degree to which fluctuations in utility revenues are dependent on changes in weather and economic conditions is accomplished through multi-factor regression analysis. In such an analysis, variables which represent weather (e.g., degree days) and economic conditions (e.g., a state or regional economic index) as well as other factors which affect utility revenues (e.g., number of customers) are regressed against the utility's revenues over a relatively long period of time (10 - 15 years). Through such an analysis (which is quite similar to analyses used to project utility revenue requirements in regulatory jurisdictions which utilize future test years), it can be determined to what degree revenues are affected by weather and economic conditions.

Regression analysis also plays a part in quantifying the revenue volatility that normally exists with the utility operation. Figure 2 shows the revenue stream of a utility operation over the past fifteen years, by quarter. Also shown on

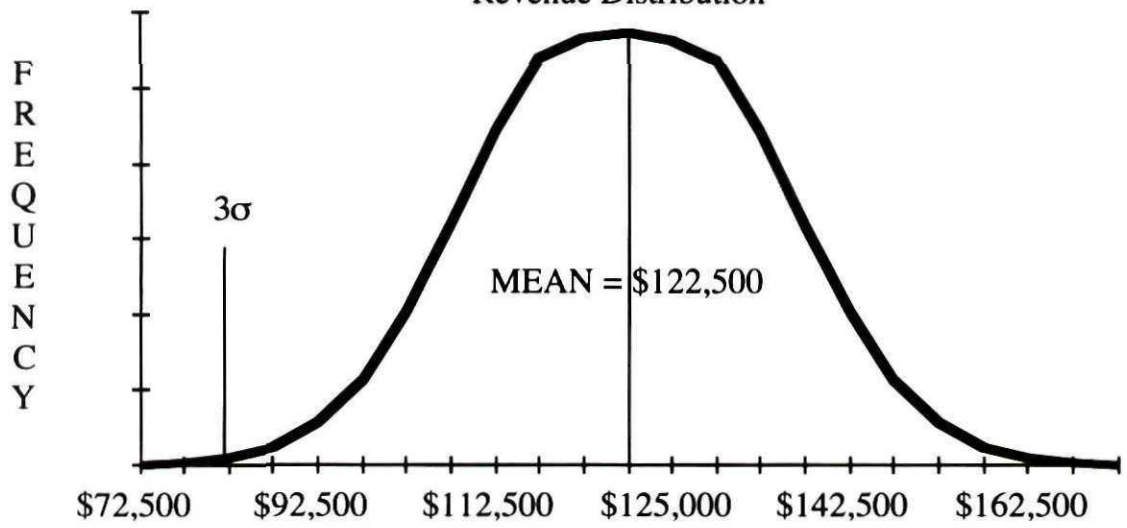
Figure 2 is the least-squares regression line which represents the trend in revenues over that time period. In addition, the variance and standard deviation of the revenues around the trend line can be calculated. That process gives a quantitative measure of the volatility of the utility's revenues around the revenue trend or regression line.

Figure 2



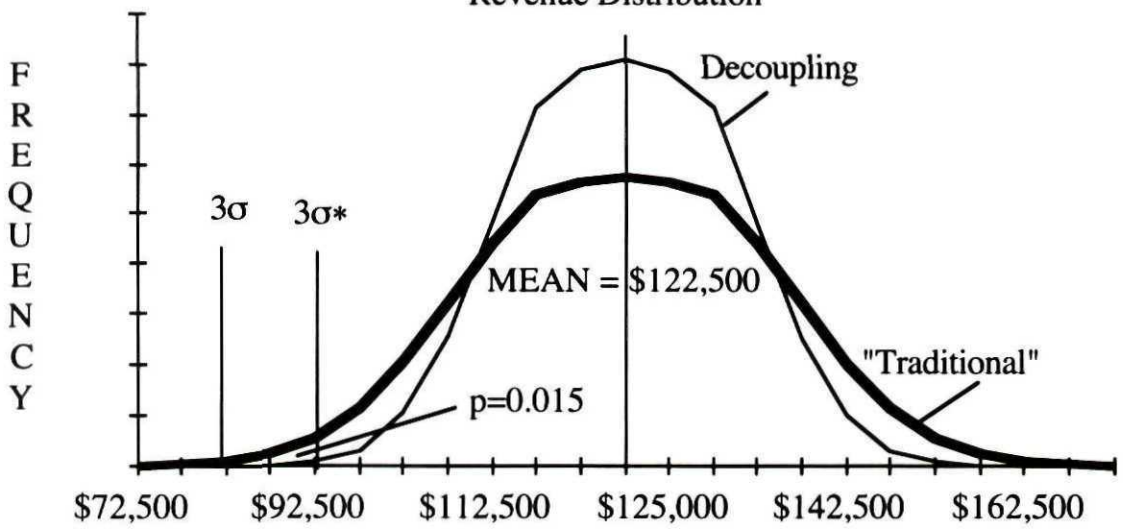
Once the standard deviation of the revenues about the trend line is established, a zone ±3 standard deviation units (σ) above and below that revenue trend line can be established. Assuming the utility's revenues are normally distributed about the revenue trend, a zone ±3σ above and below the revenue trend line establishes a range within which the utility's revenues will fall 99.9% of the time. The distribution of quarterly revenues about the utility's revenue trend line can also be represented as the familiar bell-shaped curve shown in Figure 3.

Figure 3
Revenue Distribution



When the volatility of the revenue stream is reduced, the variance of the revenues about the trend line shown in Figure 2 is reduced and the width of the zone ±3σ above and below the revenue trend line narrows. In other words, as the volatility of the utility's revenue stream is reduced, the possibility that the actual revenue (which will fall within ±3σ)will more closely approximate the expected revenue (represented by the trend line) is increased and, therefore, the utility's operating risk is reduced. Further, as the volatility of the utility's revenues around the revenue trend line is reduced, the shape of the "bell curve" graph of the revenue distribution changes. As shown in Figure 4, while still centered on the average revenue value, the "bell" formed by the distribution of utility revenues under decoupling becomes taller and thinner.

Figure 4
Revenue Distribution



It is through this change in the shape of the distribution of possible revenue outcomes, shown in Figure 4, that we are able to quantify the cost of equity capital impact of decoupling. When the variance of revenues about the trend is reduced, the possibility of more extreme outcomes, both negative and positive, are eliminated. To the investor, the risk-reducing aspect of this change is the elimination of the possibility of extreme negative outcomes. Under "traditional" regulation it is possible that the utility could experience revenues at the extreme lower left corner of the original revenue distribution (-3σ). This would represent a risky outcome to the investor. Under a decoupling scenario, where revenue volatility is reduced, the revenue distribution is narrower and the most negative outcome ($-3\sigma^*$ on the new bell curve) is a higher revenue value and, thus, represents less risk to the investor. The pertinent difference in the probable outcomes under the "traditional" and decoupling scenario is quantified as the difference in the area under the curves between -3σ and $-3\sigma^*$. This area between the original bell curve and the new (decoupling) bell curve represents the reduction in the probability of extreme negative outcomes that existed prior to decoupling. If, as shown in figure 4, the probability differential represented by the reduction in revenue volatility equals 0.015, which represents 1.5% of revenues, then investors would be indifferent between "traditional" regulation and decoupling if the equity return under decoupling produced a revenue requirement 1.5% less than that under "traditional" regulation.

EXAMPLE

Let's assume that a multiple factor regression analysis reveals that weather and economic conditions in a utility's service territory account for 50% of the fluctuation in the quarterly revenues of the utility. [Note: The author's research on the dependence of revenue volatility on weather and economic conditions indicates that those factors may be determinative of as much as 85% of revenue volatility, therefore, 50% is a conservative estimate.] In our example, reducing the variance in the utility revenues by 50% produces the taller, narrower bell-shaped curve shown in Figure 4. The difference in the area under the original bell curve and the new decoupling bell curve represents a probability of 0.015, or 1.5% of average revenues.

Continuing this example, assume our utility has a $1 Billion rate base, average annual revenues of $500 Million, an equity ratio of 45%, an allowed equity return of 12% under "traditional" regulation and a prospective tax rate of 40%. The "traditional" regulatory scheme would call for an equity return component in revenues of $90 Million (45% x 12% x (1/(1-40%)) x $1 Bill.). Using the 1.5% revenue probability differential between "traditional" regulation and decoupling hypothesized above, investors would be indifferent between the $90 Million pre-tax equity return produced by "traditional" regulation and and an equity return under under a decoupling regime which produced a pre-tax revenue requirement of $82.5 Million ($90 Mill. - ($500 Mill. x 1.5%)). The equity return which would satisfy that requirement, that is, the equity return which would produce an $82.5 Million equity component in revenues in this example is 11.00% [$82.5 Mill./ (45% x $1 Bill. x (1/(1-40%)))]. Therefore, under this example, the utility's allowed return on equity capital should be reduced from the "pre-decoupling" level of 12% to 11%.

SUMMARY

Due to the nature of decoupling and the inextricability of the impact of weather and economic conditions on per customer usage from the impact of any conservation which may occur, decoupling will reduce utility operating risk. Reduced operating risk translates to lower investment risk and lower allowed returns to the investor. Regulators are able to quantify the impact of decoupling on equity capital costs by 1) determining the degree to which weather and service territory economic health determine revenue volatility and 2) calculating the degree to which the removal of that volatility will reduce the probability of extreme negative outcomes. That percentage by which the probability of extreme negative outcomes is reduced, multiplied by the average annual revenues provides an estimate of the amount by which the

pre-tax equity return requirement can be reduced to account for the reduced risk of decoupling. This reduced pre-tax return requirement can then be translated into an appropriate return on equity to be utilized under a regulatory framework which employs decoupling.

GROWTH RATE FUNDAMENTALS

Q. PLEASE PROVIDE AN EXAMPLE WHICH DESCRIBES THE DETERMINANTS OF LONG-TERM SUSTAINABLE GROWTH.

A. Assume that a hypothetical regulated firm had a first period common equity or book value per share of $10, the investor-expected return on that equity was 10% and the stated company policy was to pay out 60% of earnings in dividends. The first period earnings per share are expected to be $1.00 ($10/share book equity x 10% equity return) and the expected dividend is $0.60. The amount of earnings not paid out to shareholders ($0.40), the retained earnings, raises the book value of the equity to $10.40 in the second period. The table below continues the hypothetical for a five year period and illustrates the underlying determinants of growth.

TABLE A.

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	GROWTH
BOOK VALUE	$10.00	$10.40	$10.82	$11.25	$11.70	4.00%
EQUITY RETURN	10%	10%	10%	10%	10%	-
EARNINGS/SH.	$1.00	$1.040	$1.082	$1.125	$1.170	4.00%
PAYOUT RATIO	0.60	0.60	0.60	0.60	0.60	-
DIVIDENDS/SH.	$0.60	$0.624	$0.649	$0.675	$0.702	4.00%

We see that under steady-state conditions, the earnings, dividends and book value all grow at the same rate. Moreover, the key to this growth is the amount of earnings retained or reinvested in the firm and the return on that new portion of equity. If we let "b" equal the retention ratio of the firm (1 – the payout ratio) and let "r" equal the firm's expected return on equity, the DCF growth rate "g" (also referred to as the internal or sustainable growth rate) is equal to their product, or

$$g = br. \qquad (i)$$

Professor Myron Gordon, who developed the Discounted Cash Flow technique and first introduced it into the regulatory arena, has determined that Equation (i) embodies the underlying fundamentals of growth and, therefore, is a primary measure of growth to be used in the DCF model. Professor Gordon's research also indicates that analysts' growth rate projections are useful in estimating investors' expected sustainable growth.

I should note here that the above hypothetical does not allow for the existence of external sources of equity financing, i.e., sales of common stock. Stock financing will cause investors to expect additional growth if the company is expected to issue new shares at a market price that exceeds book value. The excess of market over book would inure to current shareholders, increasing their per share equity value. Therefore, if the company is expected to continue to issue stock at a price that exceeds book value, the shareholders would continue to expect their book value to increase and would add that growth expectation to that stemming from earnings retention or internal growth. Conversely, if a company were expected to issue new equity at a price below book value, that would have a negative effect on shareholder's current growth rate expectations. In such a situation, shareholders would perceive an overall growth rate less than that produced by internal sources (retained earnings). Finally, with little or no expected equity financing or a market-to-book ratio near unity, investors would expect the sustainable growth rate for the company to equal that derived from Equation (i), "g = br." Dr. Gordon[1] identifies the growth rate which includes both expected internal and external financing as:

$$g = br + sv, \qquad \text{(ii)}$$

where,

g = DCF expected growth rate,
r = return on equity,
b = retention ratio,

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[1]Gordon, M.J., The Cost of Capital to a Public Utility, MSU Public Utilities Studies, East Lansing, Michigan, 1974, pp., 30–33.

v = fraction of new common stock
sold that accrues to the current
shareholder,
s = funds raised from the sale of stock
as a fraction of existing equity.

Additionally,

$$v = 1 - BV/MP, \qquad \text{(iii)}$$

where,

MP = market price,
BV = book value.

I have used Equation (iii) as the basis for my examination of the investor expected long-term growth rate (g) in this proceeding.

Q. IN YOUR PREVIOUS EXAMPLE, EARNINGS AND DIVIDENDS GREW AT THE SAME RATE (br) AS DID BOOK VALUE. WOULD THE GROWTH RATE IN EARNINGS OR DIVIDENDS, THEREFORE, BE SUITABLE FOR DETERMINING THE DCF GROWTH RATE ?

A. No, not necessarily. Rates of growth derived from earnings or dividends alone can be unreliable due to extraneous influences on those parameters such as changes in the expected rate of return on common equity or changes in the payout ratio. That is why it is necessary to examine the underlying determinants of growth through the use of a sustainable growth rate analysis.

If we take the hypothetical example previously stated and assume that, in year three, the expected return on equity rises to 15%, the resultant growth rate for earnings and dividends far exceeds that which the company could sustain indefinitely. The potential error in using those growth rates to estimate "g" is illustrated in the following table.

TABLE B.

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	GROWTH
BOOK VALUE	$10.00	$10.40	$10.82	$11.47	$12.157	5.00%
EQUITY RETURN	10%	10%	15%	15%	15%	10.67%
EARNINGS/SH.	$1.00	$1.040	$1.623	$1.720	$1.824	16.20%
PAYOUT RATIO	0.60	0.60	0.60	0.60	0.60	-
DIVIDENDS/SH.	$0.60	$0.624	$0.974	$1.032	$1.094	16.20%

What has happened is a shift in steady-state growth paths. For years one and two, the sustainable rate of growth (g=br) is 4.00%, just as in the previous hypothetical. Then, in the last three years, the sustainable growth rate increases to 6.00% (g=br = 0.4x15%). If the regulated firm were expected to continue to earn a 15% return on equity and retain 40% of its earnings, then a growth rate of 6.0% would be a reasonable estimate of the long-term sustainable growth rate. However, the compound annual growth rate for dividends and earnings exceeds 16% which is the result only of an increased equity return rather than the intrinsic ability of the firm to grow continuously at a 16% annual rate. Clearly, this type of estimate of future growth cannot be used with any reliability at all. In the case of the hypothetical, to utilize a 16% growth rate in a DCF model would be to expect the company's return on common equity to increase by 50% every five years into the indefinite future. This would be a ridiculous forecast for any regulated firm and underscores the importance of utilizing the underlying fundamentals of growth in the DCF model.

It can also be demonstrated that a change in our hypothetical regulated firm's payout ratio makes the past rate of growth in dividends an unreliable basis for predicting "g". If we assume our regulated firm consistently earns its expected equity return (10%) but in the third year, changes its payout ratio from 60% to 80% of earnings, the results are shown in the table below.

TABLE C.

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	GROWTH
BOOK VALUE	$10.00	$10.40	$10.82	$11.036	$11.26	3.01%
EQUITY RETURN	10%	10%	10%	10%	10%	-
EARNINGS/SH.	$1.00	$1.040	$1.082	$1.104	$1.126	3.01%
PAYOUT RATIO	0.60	0.60	0.80	0.80	0.80	7.46%
DIVIDENDS/SH.	$0.60	$0.624	$0.866	$0.833	$0.900	10.67%

What we see here is that, although the company has registered a high dividend growth rate (10.67%), it is, again, not at all representative of the growth that could be sustained indefinitely, as called for in the DCF model. In actuality, the sustainable growth rate has declined from 4.0% the first two years to only 2.0% (g=br = 0.2x10%) during the last three years due to the increased payout ratio. To utilize a 10% growth rate in a DCF analysis of this hypothetical regulated firm would 1) assume the payout ratio of the firm would continue to increase 33% every five years into the indefinite future, 2) lead to the highly implausible result that the firm intends to consistently pay out more in dividends than it earns and 3) grossly overstate the cost of equity capital.

SAMPLE COMPANY GROWTH RATE ANALYSES

ELECTRIC UTILITIES

CV – Central Vermont Public Service - CV's sustainable growth rate has averaged 1.5% over the most recent five year period (2004-2008), including a set-back with low growth in 2005. Absent the 2005 results, the average sustainable growth was 3.24%. In the most recent years, the company's sustainable growth has increased and was near 3.5% by 2008. VL expects CV's sustainable growth to trend below recent historical growth rate level and reach 3.1% by the 2012-2014 period. However, CV's book value growth rate is expected to be 6% over the next five years, which is well above the historical growth of 2.0%. CV's earnings per share are projected to increase at only a 2% rate, according to Value Line; IBES and Zack's do not report earnings growth projections for CV. Over the past five years, CV's earnings growth was -2.5%, according to Value Line's three-year base period calculation, but 5%, based on a simple compound average over the past five years. The company's historical dividend growth was also only 1%, and Value Line projects that dividends will remain stable in the next three- to five-year period (a 0% growth rate). Investors can reasonably expect long-term sustainable growth rate in the future to be more modest than the past but not as low as the company's current earnings growth projections; a growth rate of **3.5%** is reasonable for CV.

Regarding share growth, CV's shares outstanding decreased at a 3.9% rate over the past five years. The growth in the number of shares is projected by VL to increase at a 1.1% rate through the 2012-14 period. An expectation of share growth of **0.35%** for this company is reasonable.

FE – FirstEnergy Corp. – Historical sustainable growth data for FE averaged 5.7% over the past five years with an upward trend, which Value Line projects will continue, pushing sustainable growth to 8% by the 2012-2014 period. VL projects that FE's book value will increase at a 7.5% rate after increasing at 4.5% over the past five years, also indicating higher growth expectations. For earnings , VL's projections indicate a projected growth of 10% due to a steadily increasing ROE, while IBES and Zack's project 9% and 7%, respectively. Dividends, which grew at a 4.5% rate over the past five years are projected to grow at an 8% rate over the next 3- to 5-year period. The projected data uniformly indicate higher growth in the future for this company. Investors can reasonably expect a sustainable growth rate of **7.0%** for FE.

Regarding share growth, FE's shares outstanding showed a -2% rate of growth over the past five years. However, Value Line expects the number of shares to remain constant in the future, indicating a 0% rate of increase through 2011-13. A long-term expectation of share growth of **–1%** for this company is reasonable.

NU – Northeast Utilities – NU's sustainable growth rate has averaged 2.64% over the most recent five-year period, with 5.3% growth in the most recent year, indicating an upward trend. VL expects NU's sustainable growth to continue at approximately 4.4% through the 2012-14 period. While that is a lower rate than most recently achieved, it is higher than historical growth, on average. NU's book value growth rate is expected to be 5.5% over the next five years, up considerably from the 2.5% rate of growth experienced over the past five years. Also, NU's earnings per share are projected to increase at 10.5% according to Value Line (8.3%

IBES, 9.5% Zacks). It is worth noting that the earnings growth is predicated on an expectation of an ROE increase 20% above historical levels, according to Value Line, which is unlikely to be sustainable indefinitely. Value Line also projects a 6.5% growth in dividends, which is lower than the rate of dividend growth for the previous five years (9.5%), indicating a moderating growth trend. Also Value Line shows historical earnings growth of 7%. Investors can reasonably expect a higher sustainable growth rate in the future — **6.0%** for NU is reasonable.

Regarding share growth, NU's shares outstanding increased at approximately a 4.8% rate over the past five years. The number of shares is expected to grow at a 5.1% rate through 2011-13. An expectation of share growth of **5%** for this company is reasonable.

AEP – American Electric Power - AEP's sustainable growth rate has averaged 5.2% over the most recent five-year period published by Value Line (2003-2007). VL expects AEP's sustainable growth to continue at those levels, reaching 5.18% by the 2011-2013 period. However, AEP's book value growth rate is expected to be 6% over the next five years, above the 0% rate of growth over the past five years as published by Value Line, above internal growth projections. AEP's earnings per share are projected to increase at a 5% (VL) rate. IBES and Zacks project 5.4% and 5.5% earnings growth for AEP, respectively. AEP's dividends are expected to show 4% growth over the next five years, after growing at a -9% rate the previous five years, according to Value Line (AEP reduced dividends in 2003). Those dividend data shows higher growth expectations for the future but at an absolute level that is below earnings growth expectations. Over the past five years, AEP's earnings growth was –0.5%, according to Value Line's three-year base period methodology, and 3.5% based on a compound average calculation. Based on projected earnings, dividend and sustainable growth, investors can reasonably expect long-term sustainable growth rate in the future to be similar to the internal growth projections published by Value Line; a growth rate of **5.0%** is reasonable for AEP.

Regarding share growth, AEP's shares outstanding increased at a 0.34% rate over the past five years. The growth the number of shares is projected by VL to increase at about a 0.9% rate between 2007 and the 2011-13 period. An expectation of share growth of **0.5%** for this company is reasonable.

CNL- Cleco Corporation- CNL's sustainable growth rate has averaged 3.3% over the most recent five-year period, with a downward trend over that time period. VL projects the CNL's sustainable growth with rebound to 4.3% by the 2011-13 period. However, CNL's book value growth rate averaged 7.0% over the past five years during construction of a new power plant and is expected to decline to 6% as that plant is completed and brought on line. The completion of that plant, which doubles CNL's rate base also impacts the earnings growth projections for the company. Value Line, IBES and Zack's project very high earnings growth comparisons of 10.5%, 13.6% and 15%, respectively. Moreover, Value Line expects CNL's ROE in the 2011-2013 period to be almost 30% higher than it was in the 2005-2007 period. Those growth rates would not be considered to be sustainable unless CNL doubles its rate base and increases its earned ROE by 30% every five years into the indefinite future—an unlikely scenario. Historically, CNL's earnings declined at a 2% rate. The projected earnings and dividend growth rates are tempered by the much lower historical growth rates, indicating that long-term sustainable growth lies between the two extremes. Moderating book value growth combined with much lower projected sustainable growth are counter-acted by increasing earnings and dividend growth rates indicating that sustainable growth in

the future is likely to be higher than that in the past. Investors can reasonably expect a sustainable growth rate in the future of **6.0%** for CNL.

Regarding share growth, CNL's shares outstanding increased at a 6% rate over the past five years to assist in financing its generating plant, and Value Line projects a growth of 1.6% in the future. An expectation of share growth of **2.0%** for this company is reasonable.

EDE – Empire District Electric - EDE's internal sustainable growth rate has averaged -1% over the most recent five year period (2003-2007). Sustainable growth is expected to increase, reaching 3% by the 2011-2013 period. Also, EDE's book value growth rate is expected to be 3.0% over the next five years—above the 2% rate of growth experienced over the past five years. EDE's earnings are projected to increase at a rate of 10% (Value Line) , while Zack's reports a 0% growth expectation. Value Line's earnings projections are predicated on an assumption that EDE's ROE shows an increase of 50% over historical levels, which is certainl reasonable. However, it is not reasonable to believe that such an increase in ROE is sustainable indefinitely and therefore, the 10.5% earnings growth rate projection does not represent a reliable indication of sustainable growth. Over the past five years EDE's earnings grew at a 2% rate. EDE's dividends are expected to show 1.5% growth. Over the past five years, EDE's dividends grew at a 0% rate according to Value Line. These data indicate that investors can reasonably expect a sustainable growth rate in the future above past averages, but far below Value Line's projected earnings growth. Therefore, **2.5%** is a reasonable long-term growth expectation for EDE.

Regarding share growth, EDE's shares outstanding grew at a 7.7% rate over the past five years. Following a stock issuance in 2009, the number of shares outstanding is projected by Value Line to remain constant through 20011-13. An expectation of share growth of **3%** for this company is reasonable.

ETR – Entergy Corp. - ETR's sustainable growth rate averaged 6.66% over the most recent five year period, but the most recent two years were above that average indicating an increasing trend. VL expects ETR's sustainable growth to exceed that historical growth rate level, reaching 8.2%, by the 2011-2013 period. ETR's book value growth rate is expected to be 7.0% over the next five years, well above the 2.0% rate of growth experienced over the past five years. ETR's earnings per share are projected to increase at a rate of 7.5% (VL), Zack's (7.8%) and IBES (10.4%). ETR's dividends are expected to grow at a 6% rate—an substantial reduction from the 12.5% growth in the past. Over the past five years, ETR's earnings growth was 9%, according to VL. Investors can reasonably expect a sustainable growth rate in the future higher than that of the past and **7.0%** is reasonable for ETR.

Regarding share growth, ETR's shares outstanding decreased at approximately a 4% rate over the past five years. That rate of decrease is expected to moderate in the future to 1.2% through 2011-2013. An expectation of share growth of **–1.75%** for this company is reasonable.

IDA – IDACORP - IDA's sustainable growth rate has averaged 1.63% over the most recent five-year period, with an upward trend. VL expects IDA's sustainable growth to increase to approximately 4.3% by the 2011-2013 period. IDA's book value growth rate is expected to be 4% over the next five years, higher than the 2.5% rate of growth experienced over the past five years, pointing to higher growth in the future. Also, IDA's earnings per share are projected to increase at a rates ranging

from 5% (Value Line & IBES), to 6% (Zack's). Over the past five years, IDA's earnings growth was -7% according to Value Line. Historically, dividends grew at a –8.5% rate, and VL expects that rate to be 0% over the next five years. Investors can reasonably expect a higher sustainable growth over the long term — **4.0%** for IDA is reasonable.

Regarding share growth, IDA's shares outstanding increased at a 4.1% rate over the past five years. The number of shares is expected to increase at a 2.7% rate through 2011-13. An expectation of share growth of **3%** for this company is reasonable.

PNW – Pinnacle West Capital Corp. – Historical sustainable growth data for PNW averaged 2.3% over the past five years. VL projects that the internal growth will continue at near-current levels, reaching 2% by the 2011-13 period. Value Line's projected five-year book value growth rate for PNW is also 2.0%, which is lower than the 3.5% historical rate. VL projects PNW's earnings will increase at a 1% rate while the analysts polled by IBES and Zack's indicate 4.3% and 5.5% earnings growth for the future. Dividends, which have showed 5.5% growth historically, are projected to decline to a 1.5% rate in the future. The projected sustainable growth (2%), dividend growth and book value growth rate data indicate that investors can expect relatively low growth from PNW, while the earnings growth rate projections published by sell-side analysts indicates relatively higher growth. Investors can reasonably expect a sustainable growth rate of **2.5%** for PNW.

Regarding share growth, PNW's shares outstanding showed a 2.4% rate of growth over the past five years. However, PNW's growth rate in shares outstanding is expected to show a 1.8% rate of increase through 2011-13. A long-term expectation of share growth of **2%** for this company is reasonable.

UNS – UniSource Energy - UNS's sustainable growth rate, relatively stable throughout the period, has averaged 4.2% over the most recent five-year period. VL projects that UNS's sustainable growth will rise to about 6.5% within three to five years. UNS's book value growth rate was 8.5% over the past five years, but VL projects that growth will increase to a 9.5% rate in the future, as capital spending is expected to continue at higher-than-historically-average levels, confirming a higher growth expectation in the near-term future. Value Line reports that UNS's earnings per share are projected to increase at a rate of 13%; IBES project more modest earnings growth (5%), while Zack's publishes a 0% growth rate expectation for the next five years. Historically, earnings per share increased at 3% and dividends grew at a 15% rate (having been reinstated from a zero level in 2000), and Value Line projects that dividend growth will decline to 5.5% over the next three- to five-year period, moderating long-term growth expectations. Investors can reasonably expect a higher sustainable growth over the long term — **6.0%** for UNS is reasonable.

Regarding share growth, UNS's shares outstanding increased at a 1.1% rate over the past five years. Value Line projects that the number of shares will increase at about a 0.5% rate over the next three to five years. An expectation of share growth of **0.75%** for this company is reasonable.

XEL – Xcel Energy - XEL's sustainable growth rate has averaged 3.29% over the most recent five-year period (2003-2007), and VL expects XEL's sustainable growth to rise above that historical growth rate level and reach almost 5% by the 2011-2013 period, through an increased ROE. Also, XEL's book value growth rate is expected to be 4.5% over the next five years, which is significantly above the

historical growth of -1.5%. That information would tend to support increased long term growth expectations. XEL's earnings per share is projected to increase at 7% over the next three to five years, according to Value Line; 7% according to IBES and 6.5% according to Zack's. Over the past five years, XEL's earnings growth was negative 2%, according to Value Line's three-year base period calculation (about 3.5% based on 5-year compound growth). The company's historical dividend growth was -8.5%, but Value Line projects that dividends will grow at a 3% in the next three- to five-year period—below both the sustainable growth and earnings growth projections. Investors can reasonably expect long-term sustainable growth rate in the future to be higher than the past but not as high as the company's current earnings growth projections; a growth rate of **4.5%** is reasonable for XEL.

Regarding share growth, XEL's shares outstanding increased at a 2.4% rate over the past five years. The growth the number of shares is projected by VL to increase at a 1.3% rate through the 2011-13 period. An expectation of share growth of **2%** for this company is reasonable.

HAWAIIAN ELECTRIC COMPANY

HISTORICAL CAPITAL STRUCTURE

AMOUNT (000,000)

Type of Capital	Dec-07 [1]	Mar-08 [2]	Jun-08 [3]	Sep-08 [4]	Dec-08 [5]	**Average [6]**
1) Common Equity	$1,110,462	$1,121,015	$1,148,505	$1,174,494	$1,188,842	**$1,148,664**
2) Preferred Stock	$34,293	$34,293	$34,293	$34,293	$34,293	**$34,293**
3) Long-term Debt	$885,099	$895,028	$899,965	$903,901	$904,501	**$897,699**
5) Short-term Debt	$28,791	$89,108	$117,427	$140,995	$41,550	**$83,574**
6) TOTAL	$ 2,058,645	$ 2,139,444	$ 2,200,190	$ 2,253,683	$ 2,169,186	**$2,164,230**

PERCENTAGE

Type of Capital	Dec-07	Mar-08	Jun-08	Sep-08	Dec-08	**5 Quarter Average**
7) Common Equity	53.94%	52.40%	52.20%	52.11%	54.81%	**53.07%**
8) Preferred Stock	1.67%	1.60%	1.56%	1.52%	1.58%	**1.58%**
9) Long-term Debt	42.99%	41.83%	40.90%	40.11%	41.70%	**41.48%**
11) Short-term Debt	1.40%	4.17%	5.34%	6.26%	1.92%	**3.86%**
12) TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	**100.00%**

Data from HECO S.E.C. 10-K and 10-Q filings.

HAWAIIAN ELECTRIC COMPANY

ELECTRIC UTILITY INDUSTRY COMMON EQUITY RATIOS

ELECTRIC COMPANIES	EQUITY RATIO
Allegheny Energy, Inc. (NYSE-AYE)	42%
American Electric Power Co. (NYSE-AEP)	39%
Central Vermont Public Serv. Corp. (NYSE-CV	50%
Cleco Corporation (NYSE-CNL)	50%
DPL Inc.(NYSE-DPL)	40%
Edison International (NYSE-EIX)	40%
El Paso Electric Company (ASE-EE)	48%
FirstEnergy Corporation (NYSE-FE)	41%
FPL Group, Inc. (NYSE-FPL)	40%
Great Plains Energy Incorporated (NYSE-GXP)	47%
Hawaiian Electric Industries, Inc. (NYSE-HE)	38%
IDACORP, Inc. (NYSE-IDA)	46%
Maine & Maritimes Corporation (ASE-MAM)	53%
OGE Energy Corp. (NYSE-OGE)	44%
Otter Tail Corporation (NDQ-OTTR)	59%
Pinnacle West Capital Corp. (NYSE-PNW)	50%
PNM Resources, Inc. (NYSE-PNM)	40%
Portland General Electric (NYSE-POR)	50%
PPL Corporation (NYSE-PPL)	41%
Progress Energy Inc. (NYSE-PGN)	44%
Southern Company (NYSE-SO)	41%
UIL Holdings Corporation (NYSE-UIL)	39%
Westar Energy, Inc. (NYSE-WR)	47%
OVERALL INDUSTRY AVERAGE	**44%**
HILL'S SAMPLE GROUP AVG.	**43%**
MORIN'S INTEGRATED EL. AVG.	**44%**
MORIN'S MOODY'S EL. AVG.	**44%**

COMBINATION GAS & ELECTRIC COMPANIES	EQUITY RATIO
AES Corporation (NYSE-AES)	16%
ALLETE, Inc. (NYSE-ALE)	57%
Alliant Energy Corporation (NYSE-LNT)	60%
Ameren Corporation (NYSE-AEE)	47%
Avista Corporation (NYSE-AVA)	48%
Black Hills Corporation (NYSE-BKH)	50%
CenterPoint Energy (NYSE-CNP)	17%
CH Energy Group, Inc. (NYSE-CHG)	52%
CMS Energy Corporation (NYSE-CMS)	26%
Consolidated Edison, Inc. (NYSE-ED)	49%
Constellation Energy Group, Inc. (NYSE-CEG	37%
Dominion Resources, Inc. (NYSE-D)	39%
DTE Energy Company (NYSE-DTE)	42%
Duke Energy Corporation (NYSE-DUK)	59%
Empire District Electric Co. (NYSE-EDE)	42%
Entergy Corporation (NYSE-ETR)	38%
Exelon Corporation (NYSE-EXC)	45%
Florida Public Utilities Company (ASE-FPU)	50%
Integrys Energy Group (NYSE-TEG)	48%
MDU Resources Group, Inc. (NYSE-MDU)	61%
MGE Energy, Inc. (NDQ-MGEE)	53%
NiSource Inc. (NYSE-NI)	38%
Northeast Utilities (NYSE-NU)	39%
Northwestern Corporation (NYSE-NWE)	46%
NSTAR (NYSE-NST)	40%
Pepco Holdings, Inc. (NYSE-POM)	44%
PG&E Corporation (NYSE-PCG)	48%
Public Service Enterprise Group (NYSE-PEG)	50%
SCANA Corporation (NYSE-SCG)	42%
SEMPRA Energy (NYSE-SRE)	52%
NV Energy (NYSE-NVE)	40%
TECO Energy, Inc. (NYSE-TE)	39%
UniSource Energy Corporation (NYSE-UNS)	33%
Unitil Corporation (ASE-UTL)	34%
Vectren Corporation (NYSE-VVC)	43%
Wisconsin Energy Corporation (NYSE-WEC)	42%
Xcel Energy Inc. (NYSE-XEL)	44%

Data from AUS Utility Reports, March 2009, pp. 8, 12.

HAWAIIAN ELECTRIC COMPANY

RATEMAKNG CAPITAL STRUCTURE

Type of Capital	PERCENT	COST RATE	WT. AVG. COST RATE
Common Equity	54.30%	-	-
Preferred Stock	4.05%	7.62%	0.31%
Hybrid Securities	1.89%	7.41%	0.14%
Long-term Debt	38.27%	5.75%	2.20%
Short-term Debt	1.49%	2.50%	0.04%
Totals	100.00%		

HAWAIIAN ELECTRIC COMPANY

HISTORICAL UTILITY & GDP GROWTH RATES

YEAR	Dividends	Earnings	Book Value	GDP
1947	$1.56	$2.15	$27.92	358.4
1948	$1.60	$2.15	$28.24	379.4
1949	$1.66	$2.31	$28.52	380.4
1950	$1.76	$2.57	$29.65	414.8
1951	$1.88	$2.50	$30.88	437.5
1952	$1.91	$2.55	$31.11	461.1
1953	$2.01	$2.78	$31.54	467.2
1954	$2.13	$2.87	$32.24	506.6
1955	$2.21	$3.12	$33.36	526.4
1956	$2.32	$3.32	$34.65	544.7
1957	$2.43	$3.36	$36.57	585.6
1958	$2.50	$3.57	$38.24	617.8
1959	$2.61	$3.76	$40.14	663.6
1960	$2.68	$4.02	$41.20	719.1
1961	$2.81	$4.25	$42.95	787.8
1962	$2.97	$4.56	$44.88	832.6
1963	$3.21	$4.90	$47.91	910.0
1964	$3.43	$5.21	$50.69	984.6
1965	$3.86	$5.73	$52.68	1038.5
1966	$4.11	$6.15	$54.53	1127.1
1967	$4.34	$6.50	$57.53	1238.3
1968	$4.50	$6.71	$60.97	1382.7
1969	$4.61	$6.84	$63.90	1500.0
1970	$4.70	$6.88	$67.75	1638.3
1971	$4.77	$7.01	$70.24	1825.3
1972	$4.87	$7.56	$75.05	2030.9
1973	$5.01	$7.64	$76.84	2294.7
1974	$4.83	$7.38	$79.94	2563.3
1975	$4.97	$7.76	$85.79	2789.5
1976	$5.18	$7.87	$89.52	3128.4
1977	$5.54	$8.84	$92.96	3255.0
1978	$5.81	$8.40	$94.77	3536.7
1979	$6.22	$8.98	$99.01	3933.2
1980	$6.58	$8.75	$102.49	4220.3
1981	$6.99	$9.80	$101.84	4462.8
1982	$7.43	$10.82	$104.43	4739.5
1983	$7.87	$11.28	$106.77	5103.8
1984	$8.26	$12.52	$111.65	5484.4
1985	$8.61	$12.63	$113.12	5803.1
1986	$8.89	$12.86	$118.61	5995.9
1987	$9.12	$12.33	$122.19	6337.8
1988	$8.87	$10.03	$119.07	6657.4
1989	$8.82	$8.91	$120.87	7072.2
1990	$8.79	$9.41	$117.07	7397.7
1991	$8.95	$10.17	$125.21	7816.8
1992	$9.05	$10.26	$131.59	8304.3
1993	$8.99	$9.91	$141.22	8747.0
1994	$8.96	$8.65	$148.67	9268.4
1995	$9.02	$12.10	$139.71	9817.0
1996	$9.06	$11.89	$140.71	10128.0
1997	$9.06	$8.48	$141.97	10469.6
1998	$7.83	$5.76	$141.36	10971.3
1999	$8.10	$11.82	$180.83	11734.3
Compound Growth Rate	**3.22%**	**3.34%**	**3.66%**	**6.94%**

Data from Mergent Utility Manual 2001, and U.S. Department of Commerce

HAWAIIAN ELECTRIC COMPANY

ELECTRIC UTILITY SAMPLE GROUP SELECTION

	Company Name	Revenues % Electric	Pending Merger?	Recent Div. Cut?	Generation Assets?	Stable Book Value?	Bond Rating S&P	Bond Rating Moody's	Selected
	SCREEN	≥70%	no	no	yes	yes	A- to BBB-		
EAST									
e	Allegheny Energy	78	no	yes	yes	no	BBB+	Baa2	
e+g	CH Energy	46	no	no	yes	yes	A	A2	
e	Central Vermont P. S.	100	no	no	yes	yes	BBB+	NR	√
e+g	Consolidated Edison	64	no	no	no	yes	A-	A1	
e+g	Constellation Energy	13	no	yes	yes	yes	BBB	Baa2	
e+g	Dominion Resources	42	no	no	yes	no	A-	A3	
e+g	Duke Energy	72	no	no	yes	no	A	A3	
e+g	Excelon Corp.	55	no	no	yes	yes	A-	A3	
e	FPL Group	72	no	no	yes	yes	A	Aa3	
e	FirstEnergy Corp.	88	no	no	yes	yes	BBB+	Baa2	√
e+g	Northeast Utilities	84	no	no	yes	yes	BBB+	Baa1	√
e+g	NSTAR	79	no	no	no	yes	AA-	A1	
e	PPL Corporation	56	no	no	yes	yes	A-	A3	
e+g	Pepco Holdings, Inc.	54	no	no	no	yes	A-	Baa1	
e	Progress Energy	100	no	no	yes	yes	A-	A2	
e+g	Public Service Ent. Gp.	68	no	no	yes	yes	A-	A3	
e+g	SCANA Corp.	42	no	no	yes	yes	A-	A2	
e	Southern Company	99	no	no	yes	yes	A	A2	
e+g	TECO Energy	62	no	no	yes	yes	BBB-	Baa2	
e	UIL Holdings Corp.	100	no	no	no	yes	NR	Baa2	
CENTRAL									
e+g	ALLETE	89	no	no	yes	no	A-	NR	
e+g	Alliant Energy	69	no	no	yes	yes	A-	A2	
e+g	Ameren Corp.	82	no	yes	yes	yes	BBB	Baa2	
e	American Eelectric Power	92	no	no	yes	yes	BBB	Baa1	√
e+g	CMS Energy Corp.	53	no	yes	yes	no	BBB	Baa1	
e+g	CenterPoint Energy	15	no	no	no	no	BBB+	Baa2	
e	Cleco Corporation	95	no	no	yes	yes	BBB	Baa1	√
e	DPL Inc.	100	no	no	yes	yes	A-	A2	
e+g	DTE Energy	58	no	no	yes	yes	A-	A3	
e+g	Empire District Electric	87	no	no	yes	yes	BBB+	Baa1	√
e+g	Entergy Corp.	76	no	no	yes	yes	A-	Baa2	√
e	Great Plains Energy	60	no	yes	yes	yes	BBB	A3	
e+g	Intergrys Energy	10	no	no	yes	yes	A	A1	
e	ITC Holdings	100	no	no	no	yes	A-	A3	
e+g	MGE Energy	59	no	no	yes	yes	AA-	Aa2	
e	OGE Energy Corp.	48	no	no	yes	yes	BBB +	Baa1	
e	Otter Tail Corp.	28	no	no	yes	yes	BBB-	A3	
e+g	Vectren Corp.	21	no	no	yes	yes	A	A3	
e	Westar Energy	64	no	no	yes	yes	BBB-	Baa2	
e+g	Wisconsin Energy	61	no	no	yes	yes	A-	Aa3	
WEST									
e+g	Avista Corp.	50	no	no	yes	yes	BBB+	Baa2	
e+g	Black Hills Corp.	38	no	no	yes	yes	BBB	Baa1	
e	Edison International	80	no	yes	yes	yes	A	A2	
e	El Paso Electric	98	no	yes	yes	yes	BBB	Baa2	
e	Hawaiian Electric†	85	no	no	yes	yes	BBB	Baa2	
e	IDACORP, Inc.	100	no	no	yes	yes	A-	A3	√
e+g	NV Energy	94	no	yes	yes	no	BBB	Baa3	
e+g	PG&E Corp.	72	no	yes	yes	no	BBB+	A3	
e	PNM Resources	100	no	yes	yes	yes	BB+	Ba1	
e	Pinnacle West Capital	89	no	no	yes	yes	BBB-	Baa2	√
e	Portland General	98	no	yes	yes	no	A	Baa1	
e+g	Sempra Energy	21	no	no	yes	yes	A+	A1	
e+g	UniSource Energy	84	no	no	yes	yes	BBB	Baa2	√
e+g	Xcel Energy, Inc.	78	no	no	yes	yes	A-	A3	√

e= electric company; e+g=combination electric and gas company

HAWAIIAN ELECTRIC COMPANY
DCF GROWTH RATE PARAMETERS
ELECTRIC UTILITIES

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
CV	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2004	0.2640	06.8%	1.80%	18.49	12.19	
2005	-10.5000	00.5%	-5.25%	17.70	12.28	
2006	0.4356	10.1%	4.40%	17.70	10.13	
2007	0.3826	08.2%	3.14%	18.43	10.24	
2008	0.4250	08.5%	3.61%	19.25	10.40	
AVERAGE GROWTH			1.54%	2.00%		-3.89%
2009	0.4250	08.0%	3.40%		10.50	0.96%
2010	0.4424	07.5%	3.32%		10.60	-0.50%
2012-2014	0.4743	06.5%	3.08%	6.00%	11.00	1.13%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
FE	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2004	0.3105	10.6%	3.29%	26.04	329.84	
2005	0.3979	10.2%	4.06%	27.86	329.84	
2006	0.5157	13.9%	7.17%	28.30	319.21	
2007	0.5142	14.6%	7.51%	29.45	304.84	
2008	0.4884	13.5%	6.59%	31.30	304.84	
AVERAGE GROWTH			5.72%	4.50%		-1.95%
2009	0.4947	14.0%	6.93%		304.84	0.00%
2010	0.5048	14.5%	7.32%		304.84	0.00%
2012-2014	0.5429	15.0%	8.14%	7.50%	304.84	0.00%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
NU	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2004	0.3077	05.1%	1.57%	17.80	129.03	
2005	0.3061	05.1%	1.56%	18.46	131.59	
2006	0.1098	04.3%	0.47%	18.14	154.23	
2007	0.5094	08.4%	4.28%	18.65	156.22	
2008	0.5538	09.6%	5.32%	19.38	155.83	
AVERAGE GROWTH			2.64%	2.50%		4.83%
2009	0.5000	09.0%	4.50%		168.00	7.81%
2010	0.5000	09.0%	4.50%		179.00	7.18%
2012-2014	0.4889	09.0%	4.40%	5.50%	200.00	5.12%

HAWAIIAN ELECTRIC COMPANY
DCF GROWTH RATE PARAMETERS
ELECTRIC UTILITIES

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
AEP	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2003	0.3478	12.4%	4.31%	19.93	395.02	
2004	0.4636	12.2%	5.66%	21.32	395.86	
2005	0.4621	11.3%	5.22%	23.08	393.72	
2006	0.4755	12.0%	5.71%	23.73	396.67	
2007	0.4476	11.4%	5.10%	25.17	400.43	
AVERAGE GROWTH			5.20%	0.00%		0.34%
2008	0.4441	11.0%	4.88%		404.00	0.89%
2009	0.4813	11.0%	5.29%		409.00	1.06%
2011-2013	0.4933	10.5%	5.18%	6.00%	419.00	0.91%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
CNL	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2003	0.2857	12.5%	3.57%	10.09	47.18	
2004	0.3182	11.9%	3.79%	10.83	49.62	
2005	0.3662	10.7%	3.92%	13.69	49.99	
2006	0.3382	08.3%	2.81%	15.22	57.57	
2007	0.3182	07.8%	2.48%	16.85	59.94	
AVERAGE GROWTH			3.31%	7.00%		6.17%
2008	0.4545	09.0%	4.09%		61.00	1.77%
2009	0.4865	09.5%	4.62%		62.00	1.70%
2011-2013	0.3800	11.5%	4.37%	6.00%	65.00	1.63%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
EDE	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2003	0.0078	07.8%	0.06%	15.17	24.98	
2004	-0.4884	05.8%	-2.83%	14.76	25.70	
2005	-0.3913	06.0%	-2.35%	15.08	26.08	
2006	0.0922	08.5%	0.78%	15.49	30.25	
2007	-0.1743	06.2%	-1.08%	16.04	33.61	
AVERAGE GROWTH			-1.08%	2.00%		7.70%
2008	-0.0240	07.5%	-0.18%		34.00	1.16%
2009	0.1742	08.5%	1.48%		38.50	7.03%
2011-2013	0.3000	10.5%	3.15%	3.00%	38.50	2.75%

HAWAIIAN ELECTRIC COMPANY
DCF GROWTH RATE PARAMETERS
ELECTRIC UTILITIES

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
ETR	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2003	0.5652	09.8%	5.54%	38.02	228.90	
2004	0.5191	11.0%	5.71%	38.26	216.83	
2005	0.5091	11.9%	6.06%	35.71	216.83	
2006	0.5970	13.8%	8.24%	40.45	202.67	
2007	0.5393	14.4%	7.77%	40.71	193.12	
AVERAGE GROWTH			6.66%	3.00%		-4.16%
2008	0.5489	16.0%	8.78%		189.00	-2.13%
2009	0.5833	16.5%	9.63%		182.00	-2.92%
2011-2013	0.5875	14.0%	8.23%	7.50%	182.00	-1.18%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
IDA	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2003	-0.7708	04.2%	-3.24%	22.54	38.34	
2004	0.3684	07.2%	2.65%	23.88	42.22	
2005	0.3143	06.2%	1.95%	24.04	42.66	
2006	0.4894	08.9%	4.36%	25.77	43.63	
2007	0.3548	06.8%	2.41%	26.79	45.06	
AVERAGE GROWTH			1.63%	2.50%		4.12%
2008	0.4667	08.5%	3.97%		45.60	1.20%
2009	0.4667	08.0%	3.73%		47.00	2.13%
2011-2013	0.5472	08.0%	4.38%	4.00%	51.50	2.71%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
PNW	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2003	0.3135	08.1%	2.54%	31	91.26	
2004	0.2907	08.0%	2.33%	32.14	91.29	
2005	0.1384	06.5%	0.90%	34.57	91.79	
2006	0.3596	09.2%	3.31%	34.48	99.96	
2007	0.2905	08.5%	2.47%	35.15	100.49	
AVERAGE GROWTH			2.31%	3.50%		2.44%
2008	0.2500	08.0%	2.00%		101.00	0.51%
2009	0.1923	07.0%	1.35%		101.50	0.50%
2011-2013	0.2667	07.5%	2.00%	2.00%	110.00	1.82%

HAWAIIAN ELECTRIC COMPANY
DCF GROWTH RATE PARAMETERS
ELECTRIC UTILITIES

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
UNS	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2003	0.5385	08.4%	4.52%	15.97	33.79	
2004	0.5115	07.9%	4.04%	16.95	34.26	
2005	0.4154	07.5%	3.12%	17.68	34.87	
2006	0.5459	10.6%	5.79%	18.59	35.19	
2007	0.4194	08.5%	3.56%	19.54	35.32	
AVERAGE GROWTH			4.21%	8.50%		1.11%
2008	-1.4000	02.5%	-3.50%		35.50	0.51%
2009	0.6222	12.0%	7.47%		35.70	0.54%
2011-2013	0.6492	10.0%	6.49%	9.50%	36.30	0.55%

COMPANY	INTERNAL GROWTH				EXTERNAL GROWTH	
XEL	RETENTION RATIO	EQUITY RETURN	"g"	BOOK VALUE ($/SHARE)	SHARES OUTST (MILLIONS)	SHARE GROWTH
2003	0.3902	09.8%	3.82%	12.95	389.96	
2004	0.3622	10.0%	3.62%	12.99	400.46	
2005	0.2917	09.2%	2.68%	13.37	403.39	
2006	0.3481	09.7%	3.38%	14.28	407.30	
2007	0.3259	09.1%	2.97%	14.70	428.78	
AVERAGE GROWTH			3.29%	-1.50%		2.40%
2008	0.3562	09.5%	3.38%		449.05	4.73%
2009	0.3533	09.5%	3.36%		451.50	2.62%
2011-2013	0.4700	10.5%	4.94%	4.50%	458.00	1.33%

Data from Value Line Investment Survey, December 26, 2008, February 6 and 27, 2009

HAWAIIAN ELECTRIC COMPANY

DCF GROWTH RATES
ELECTRIC UTILITIES

COMPANY	br	+	sv=g*(1-(1/(M/B)))	=	g
CV	3.50%	+	0.25% (1 - (1/ 1.13)))	=	3.53%
FE	7.00%	+	-1.00% (1 - (1/ 1.45)))	=	6.69%
NU	6.00%	+	5.00% (1 - (1/ 1.13)))	=	6.59%
AEP	5.00%	+	0.50% (1 - (1/ 1.08)))	=	5.04%
CNL	6.00%	+	2.00% (1 - (1/ 1.15)))	=	6.27%
EDE	2.75%	+	3.00% (1 - (1/ 0.96)))	=	2.62%
ETR	7.00%	+	-1.75% (1 - (1/ 1.57)))	=	6.36%
IDA	4.00%	+	3.00% (1 - (1/ 0.94)))	=	3.80%
PNW	2.50%	+	2.00% (1 - (1/ 0.86)))	=	2.18%
UNS	6.00%	+	0.75% (1 - (1/ 1.21)))	=	6.13%
XEL	4.50%	+	2.00% (1 - (1/ 1.14)))	=	4.75%

Median Market-to-Book Ratio = 1.13

CV	=	Central Vermont P. S.
FE	=	FirstEnergy Corp.
NU	=	Northeast Utilities
AEP	=	American Electric Power
CNL	=	Cleco Corporation
EDE	=	Empire District Electric
ETR	=	Entergy Corp.
IDA	=	Idacorp
PNW	=	Pinnacle West Capital
UNS	=	Unisource Energy
XEL	=	Xcel Energy

g*= expected growth in number of shares outstanding

HAWAIIAN ELECTRIC COMPANY

GROWTH RATE COMPARISON
ELECTRIC UTILITIES

	DCF	Value Line Projected			IBES	Value Line Historic			IBES & VL	5-yr Compound Hist.		
COMPANY	Growth	EPS	DPS	BVPS	EPS	EPS	DPS	BVPS	AVGS.	EPS	DPS	BVPS
CV	3.53%	2.00%	0.00%	6.00%	n/a	-2.50%	1.00%	2.00%	1.42%	5.06%	0.00%	2.09%
FE	6.69%	10.00%	8.00%	7.50%	9.00%	6.00%	4.50%	4.50%	7.07%	11.39%	4.67%	5.29%
NU	6.59%	10.50%	6.50%	5.50%	8.32%	8.50%	9.50%	2.50%	7.33%	15.86%	8.56%	2.91%
AEP	5.04%	5.00%	4.00%	6.00%	5.38%	-0.50%	-9.00%	0.00%	1.55%	3.12%	-0.12%	6.30%
CNL	6.27%	10.50%	9.50%	6.00%	13.63%	-2.00%	0.50%	7.00%	6.45%	5.54%	0.00%	11.96%
EDE	2.62%	10.00%	1.50%	3.00%	n/a	2.00%	0.00%	2.00%	3.08%	-0.63%	0.00%	1.82%
ETR	6.36%	7.50%	6.00%	7.50%	10.42%	9.50%	12.50%	3.00%	8.06%	12.56%	13.40%	2.56%
IDA	3.80%	5.00%	0.00%	4.00%	5.00%	-7.00%	-8.50%	2.50%	0.14%	18.57%	-6.73%	4.28%
PNW	2.18%	1.00%	1.50%	2.00%	4.33%	-2.50%	5.50%	3.50%	2.19%	2.13%	3.95%	3.04%
UNS	6.13%	13.00%	5.50%	9.50%	5.00%	3.00%	15.50%	8.50%	8.57%	-21.00%	9.86%	3.43%
XEL	4.75%	7.50%	3.00%	4.50%	7.15%	-2.00%	-8.50%	-1.50%	1.45%	3.49%	4.62%	3.39%
		7.45%	4.14%	5.59%		1.14%	2.09%	3.09%		5.10%	3.47%	4.28%
AVERAGES	4.90%		5.73%		7.58%		2.11%		4.30%		4.28%	

Zack's growth rates: CV-N/A, FE-7%, NU-9.5%,AEP-5.5%, CNL-15%, EDE-0%, ETR-7.8%, IDA-6.0%, PNW-5.5%, UNS-0%, XEL-6.5%. Zack's average earnings growth = 6.3%.

HAWAIIAN ELECTRIC COMPANY

STOCK PRICE, DIVIDENDS, YIELDS
ELECTRIC UTILITIES

COMPANY	AVG. STOCK PRICE 4/16/07-5/25/07 (PER SHARE)		ANNUALIZED DIVIDEND (PER SHARE)	DIVIDEND YIELD
CV	$23.07		$0.92	3.99%
FE	$49.02	*	$2.35	4.79%
NU	$23.28		$0.95	4.09%
AEP	$30.96	*	$1.72	5.84%
CNL	$21.63		$0.96	4.42%
EDE	$16.52		$1.28	7.75%
ETR	$72.26		$3.00	4.15%
IDA	$27.08		$1.20	4.43%
PNW	$31.39		$2.15	6.84%
UNS	$26.47		$1.16	4.38%
XEL	$18.15	*	$1.00	5.49%
			AVERAGE	**5.11%**

* Dividend increased by (1+g), derived on DOD-208.

DOD-210
DOCKET NO. 06-0386

HAWAIIAN ELECTRIC COMPANY

DCF COST OF EQUITY CAPITAL
ELECTRIC UTILITIES

COMPANY	DIVIDEND YIELD Schedule 6	GROWTH RATE Schedule 5	DCF COST OF EQUITY CAPITAL
CV	3.99%	3.53%	7.52%
FE	4.79%	6.69%	11.48%
NU	4.09%	6.59%	10.68%
AEP	5.84%	5.04%	10.88%
CNL	4.42%	6.27%	10.69%
EDE	7.75%	2.62%	10.37%
ETR	4.15%	6.36%	10.51%
IDA	4.43%	3.80%	8.24%
PNW	6.84%	2.18%	9.02%
UNS	4.38%	6.13%	10.51%
XEL	5.49%	4.75%	10.24%
		AVERAGE	**10.01%**
		STANDARD DEVIATION	**1.22%**

HAWAIIAN ELECTRIC COMPANY

MULTI-STAGE DCF
ELECTRIC UTILITIES

Sample Companies With Earnings Projections	Projected Earnings Growth Rates			Average	CASH FLOWS							DCF Cost of Equity
	Value Line	IBES	Zacks	First Stage Growth Rate	Recent Price	Year 1 Dividend	Year 2 Dividend	Year 3 Dividend	Year 4 Dividend	Year 5 Dividend	Years 6-100 Div. Growth	k = Internal Rate of Return
Central Vermont P. S.	2.00%	n/a	n/a	2.00%	$23.07	$0.92	$0.94	$0.96	$0.98	$1.00	4.20%	7.76%
FirstEnergy Corp.	10.00%	9.00%	7.00%	8.67%	$49.02	$2.35	$2.55	$2.77	$3.02	$3.28	4.20%	9.73%
Northeast Utilities	10.50%	8.32%	9.50%	9.44%	$23.28	$0.95	$1.04	$1.14	$1.25	$1.37	4.20%	9.03%
American Electric Power	5.00%	5.38%	5.50%	5.29%	$30.96	$1.72	$1.81	$1.91	$2.01	$2.11	4.20%	9.94%
Cleco Corporation	10.50%	13.63%	15.00%	13.04%	$21.63	$0.90	$1.02	$1.15	$1.30	$1.47	4.20%	9.73%
Empire District Electric	10.00%	n/a	0.00%	5.00%	$16.52	$1.28	$1.34	$1.41	$1.48	$1.56	4.20%	12.14%
Entergy Corp.	7.50%	10.42%	7.80%	8.57%	$72.26	$3.00	$3.26	$3.54	$3.84	$4.17	4.20%	8.96%
Idacorp	5.00%	5.00%	6.00%	5.33%	$27.08	$1.25	$1.32	$1.39	$1.46	$1.54	4.20%	8.94%
Pinnacle West Capital	1.00%	4.33%	5.50%	3.61%	$31.39	$2.10	$2.18	$2.25	$2.34	$2.42	4.20%	10.75%
Unisource Energy	13.00%	5.00%	0.00%	6.00%	$26.47	$1.16	$1.23	$1.30	$1.38	$1.46	4.20%	8.80%
Xcel Energy	7.50%	4.88%	6.50%	6.29%	$18.15	$1.00	$1.06	$1.13	$1.20	$1.28	4.20%	10.08%
											Average	**9.62%**

HAWAIIAN ELECTRIC COMPANY

CAPM COST OF EQUITY CAPITAL
ELECTRIC UTILITIES

$$k = rf + B\,(rm - rf)$$

[rf]*	= 3.47%
[rm - rf]†	= 5.00% (geometric mean)
[rm - rf]†	= 6.50% (arithmetic mean)
[rm - rf]††	= 5.30%
average beta (Value Line)	= 0.72

k = 3.47% + 0.72 (5.00%/5.30%/6.50%)
k = 3.47% + 3.61%/3.83%/4.70%
k = 7.09% /7.30%/8.17%

*Current T-Bond yields, six-week average yield from Value Line Selection & Opinion (4/20/07-5/25/07, inclusive)
†Geometric and arithmetic market risk premiums from Morningstar 2007 SBBI Yearbook, p. 28.
†† Mid-point long- and short-term market risk premium from Brealey, R., Meyers, S., Allen, F., Principles of Corporate Finance, 8th Edition, McGraw-Hill, Irwin, Boston MA, 2006, pp. 149, 154, 222.

HAWAIIAN ELECTRIC COMPANY
PROOF

If market price exceeds book value,
the market-to-book ratio is greater than 1.0,
and the earnings-price ratio understates the cost of capital.

MP = market price
BV = book value
i = cost of equity capital
r = earned return
E = earnings

1. At MP = BV, $i = r = \frac{E}{MP}$.
2. $E = rBV$.
3. Then, $\frac{E}{MP} = \frac{rBV}{MP}$.
4. When BV < MP, i.e., $\frac{BV}{MP} < 1$, then,
   a. $\frac{E}{MP} < r$, since $\frac{E}{MP} = \frac{rBV}{MP} < r$, because $\frac{BV}{MP} < 1$;
   b. $i < r$, since at $\frac{BV}{MP} = 1$, $i = \frac{E}{MP} = \frac{rBV}{MP}$, but if $\frac{BV}{MP} < 1$, then $i < r$; and
   c. $\frac{E}{MP} < i$, since at $\frac{BV}{MP} = 1$, $i = \frac{E}{MP} = \frac{rBV}{MP}$, but if $\frac{BV}{MP} < 1$, then $\frac{E}{MP} < i$, because,
      1) $\frac{BV}{MP} < 1$, through MP increasing, and, if so, $\frac{E}{MP}$ decreases, therefore, $\frac{E}{MP} < i$, or
      2) $\frac{BV}{MP} < 1$, through BV decreasing, and, if so, given $E = rBV$, $\frac{E}{MP}$ decreases, therefore, $\frac{E}{MP} < i$.
5. Ergo, $\frac{E}{MP} < i < r$, the earnings-price ratio is lower than the cost of capital, which is lower than the earned return.

HAWAIIAN ELECTRIC COMPANY

MODIFIED EARNINGS-PRICE RATIO ANALYSIS
ELECTRIC UTILITIES

COMPANY	IBES 2010 Earnings (Per Share)	Market Price (Per share)	Earnings-Price Ratio	Current R.O.E. 2009	Projected R.O.E. 2011-2013
CV	$1.60	$23.07	6.94%	7.50%	6.50%
FE	$4.74	$49.02	9.67%	14.50%	15.00%
NU	$1.88	$23.28	8.07%	9.00%	9.00%
AEP	$3.23	$30.96	10.43%	11.00%	10.50%
CNL	$1.84	$21.63	8.51%	9.50%	11.50%
EDE	$1.52	$16.52	9.20%	8.50%	10.50%
ETR	$7.41	$72.26	10.26%	16.50%	14.00%
IDA	$2.27	$27.08	8.38%	8.00%	8.00%
PNW	$2.56	$31.39	8.15%	7.00%	7.50%
UNS	$2.97	$26.47	11.22%	12.00%	10.00%
XEL	$1.53	$18.15	8.43%	9.50%	10.50%
		AVERAGE	9.02%	10.27%	
		CURRENT M.E.P.R.	**9.65%**		
		AVERAGE	9.02%		10.27%
		PROJECTED M.E.P.R.		**9.65%**	

HAWAIIAN ELECTRIC COMPANY

MARKET-TO-BOOK RATIO ANALYSIS
ELECTRIC UTILITIES

$k = R.O.E.(1-b)/(M/B) + g$
[2009]

COMPANY								MARKET-TO-BOOK COST OF EQUITY
CV	k= 7.5%	(1-	0.4424)/	1.13	+	3.53%	=	7.24%
FE	k= 14.5%	(1-	0.5048)/	1.45	+	6.69%	=	11.62%
NU	k= 9.0%	(1-	0.5000)/	1.13	+	6.59%	=	10.56%
AEP	k= 11.0%	(1-	0.4813)/	1.08	+	5.04%	=	10.32%
CNL	k= 9.5%	(1-	0.4865)/	1.15	+	6.27%	=	10.49%
EDE	k= 8.5%	(1-	0.1742)/	0.96	+	2.62%	=	9.95%
ETR	k= 16.5%	(1-	0.5833)/	1.57	+	6.36%	=	10.73%
IDA	k= 8.0%	(1-	0.4667)/	0.94	+	3.80%	=	8.35%
PNW	k= 7.0%	(1-	0.1923)/	0.86	+	2.18%	=	8.74%
UNS	k= 12.0%	(1-	0.6222)/	1.21	+	6.13%	=	9.88%
XEL	k= 9.5%	(1-	0.3533)/	1.14	+	4.75%	=	10.13%
							AVERAGE	**9.82%**
							STANDARD DEVIATION	**1.24%**

Note: Equity returns and retention ratios based on Value Line current year projections.

HAWAIIAN ELECTRIC COMPANY

MARKET-TO-BOOK RATIO ANALYSIS
ELECTRIC UTILITIES

$k = R.O.E.(1-b)/(M/B) + g$
[2011-2013]

COMPANY									MARKET-TO-BOOK COST OF EQUITY
CV	k= 6.5%	(1-	0.4743	)/	1.13	+	3.53%	=	6.56%
FE	k= 15.0%	(1-	0.5429	)/	1.45	+	6.69%	=	11.40%
NU	k= 9.0%	(1-	0.4889	)/	1.13	+	6.59%	=	10.65%
AEP	k= 10.5%	(1-	0.4933	)/	1.08	+	5.04%	=	9.96%
CNL	k= 11.5%	(1-	0.3800	)/	1.15	+	6.27%	=	12.45%
EDE	k= 10.5%	(1-	0.3000	)/	0.96	+	2.62%	=	10.29%
ETR	k= 14.0%	(1-	0.5875	)/	1.57	+	6.36%	=	10.04%
IDA	k= 8.0%	(1-	0.5472	)/	0.94	+	3.80%	=	7.66%
PNW	k= 7.5%	(1-	0.2667	)/	0.86	+	2.18%	=	8.56%
UNS	k= 10.0%	(1-	0.6492	)/	1.21	+	6.13%	=	9.03%
XEL	k= 10.5%	(1-	0.4700	)/	1.14	+	4.75%	=	9.62%
								AVERAGE	**9.66%**
								STANDARD DEVIATION	**1.66%**

Note: Equity returns and retention ratios based on Value Line three- to five-year projections.

HAWAIIAN ELECTRIC COMPANY

LEVERAGE/BETA ADJUSTMENT TO THE COST OF EQUITY CAPITAL

ELECTRIC UTILITY SAMPLE

COMPANY	COMMON EQUITY	FIXED INCOME CAPITAL	M/B RATIO	MKT. VALUE DEBT(1-t)/EQ.
Central Vermont P. S.	50.00%	50.00%	1.13	0.58
FirstEnergy Corp.	41.00%	59.00%	1.45	0.65
Northeast Utilities	39.00%	61.00%	1.13	0.90
American Electric Power	39.00%	61.00%	1.08	0.94
Cleco Corporation	50.00%	50.00%	1.15	0.57
Empire District Electric	42.00%	58.00%	0.96	0.94
Entergy Corp.	38.00%	62.00%	1.57	0.68
Idacorp	46.00%	54.00%	0.94	0.81
Pinnacle West Capital	50.00%	50.00%	0.86	0.76
Unisource Energy	33.00%	67.00%	1.21	1.09
Xcel Energy	44.00%	56.00%	1.14	0.73
AVE3RAGE	42.91%	57.09%	1.13	**0.78**
HECO Capital Structure	53.40%	46.60%	1.13	**0.50**

AVERAGE (LEVERED) UTILITY BETA = 0.72

Beta (Unlevered) = Average Beta/Sample Group (1+D(1-t)/E)

Beta (Unlevered) = 0.72/(1+.78)= **0.40**

Beta (Relevered) = Beta (Unlevered)*Target Company (1+D(1-t)/E)

Beta (Relevered)= 0.40(1.50)= **0.61**

IMPACT ON COST OF EQUITY CAPITAL

Measured Beta	0.72
Relevered Beta	0.61
[1] Diff. in Beta	0.11
[2] Market Risk Premium (rm-rf) =	5% to 6.5%
Average Cost of equity impact = [1] x [2] =	**0.57%-0.74%**

Notes:
Equity Ratios from AUS Utility Reports, March 2009.
Market-tobook ratios = current price/2008 book value (Value Line).

HAWAIIAN ELECTRIC COMPANY

OVERALL COST OF CAPITAL

Type of Capital	PERCENT [1]	COST RATE [2]	WT. AVG. COST RATE [3]=[1]x[2]
1) Common Equity	54.30%	9.50%	5.16%
2) Preferred Stock	4.05%	7.62%	0.31%
3) Hybrid Securities	1.89%	7.41%	0.14%
4) Long-term Debt	38.27%	5.75%	2.20%
5) Short-term Debt	1.49%	2.50%	0.04%
Totals	100.00%		**7.84%**

PRE-TAX INTEREST COVERAGE* = 4.71x

*Assuming the Company experiences, prospectively, a combined income tax rate of 38%, the pre-tax overall return would be 11.196% [7.705%-(.14%+2.201%%+0.037%) =5.467%/(1-38%) = 8.818%+(.14%+2.201%%+0.037%)]. That pre-tax overall return, divided by the weighted cost of debt (.14%+2.201%%+0.037%), indicates a pre-tax interest coverage level of 4.71 times.

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Application of	)	
	)	
HAWAIIAN ELECTRIC COMPANY, INC.	)	DOCKET NO. 2008-0083
	)	
For Approval of Rate Increases and Revised Rate Schedules and Rules	)	
	)	

DIRECT TESTIMONY OF STEPHEN G. HILL

ON BEHALF OF

THE DEPARTMENT OF DEFENSE

COMES NOW, DEPARTMENT OF DEFENSE by and through its undersigned attorney and hereby submits Direct Testimony of Stephen G. Hill to Hawaiian Electric Company, Inc.

DATED: Honolulu, Hawaii, April 17, 2009

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CERTIFICATE OF SERVICE

I hereby certify that one copy of the foregoing document was duly served upon the following parties, by personal service, hand-delivery, and/or U.S. mail, postage prepaid, and properly addressed pursuant to HAR sec. 6-61-21(d).

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